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ABSTRACT

One of a series of eleven curriculum manuals which cover the four transportation topics of public transportation, transportation and the environment, transportation safety, and bicycles for elementary, secondary, and adult levels, this manual for grades K-3 covers all four topics. Materials in the thirteen mini-units present different aspects of the four topics. Each mini-unit consists of a lesson plan component, which provides a suggested sequence of learning activities, and an individual learning activities component which describes in detail how to implement the exercises. Typical mini-units focus on street signs, emergency vehicles, learning to ride a bike, and an introduction to the concepts of pollution and energy conservation. Most units provide opportunity to exercise basic skills in language arts, mathematics, and social interaction and thus may be integrated with other parts of the K-3 curriculum. Supplementary activities are included for each topic which offer additional learning activities for independent use; quizzes for activity or mini-unit evaluation are also included. Also included are instructions for selecting and conducting the activities and references for further study resources. Masters are included for reproduction of role profiles, game boards, maps, and other distributable materials. A curriculum guide, CE 014 028, is also available for use with the manuals. (TA)

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TRAVEL ON!

MINI-UNITS AND LEARNING ACTIVITIES ON TRANSPORTATION

for

grades K-3

by

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EDUCATION & WELFARE
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SPIRIT MASTERS

FOREWORD

TEACHING TRANSPORTATION: AN OVERVIEW

> Nearly everything Americans do, from mailing a postcard to walking on the moon, depends on transportation. Transportation is essential for the supply of food, clothing and shelter, for national defense and employment, for education and recreation, for the international exchange of goods and services.

While every American is provided with the necessities and amenities of modern life through an intricate freight-carrying network, we think of transportation most readily in terms of moving people, not products, and for good reason. Millions of us commute to work every day by car, bus, train, or subway. Moreover, 21 million youngsters travel on school buses every day. Americans use a variety of transportation modes for other purposes, including shopping, recreation, tourism, and moving. The average family changes residence once every five years and makes use of one of the many thousands of for-hire companies that provide domestic surface transportation. In addition, Americans travel more than 1.7 trillion miles by passenger cars or trucks every year, while AMTRAK's 250 trains cover 26,000 miles and service 484 communities with more than 7 million people annually using the New York to Washington run alone. There are also 950 intercity bus companies whose 20,600 vehicles travel 1.1 billion miles each year, while commercial aircraft transport over 210 million passengers annually.

Americans are highly dependent on transportation services for recreation purposes, too. Not only are vehicles used for transportation to places of entertainment, many vehicles are themselves forms of recreation. For example, there are approximately 7.3 million registered boats in the country, not counting rowboats and canoes. Seven and one-half million motor homes, truck campers, and travel and camping trailers are on the roads. Snowmobiles, dune buggies, and home-built vehicles have become widespread in the past few years.

Americans also relax on two-wheeled vehicles: there are 100 million bicycles and nearly five million motorcycles in the country, many of which are used for commuting as well as for recreation.

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[*] John Burby, *The Great American Motion Sickness*, Little, Brown and Co., (Boston: 1971), page 3.

The most frequently used form of transportation in the nation, however, is walking. We sometimes forget that pedestrians utilize the single most common mode of travel.

Finally, the overwhelming importance of transportation in our lives must be assessed not only in terms of movement of goods and people, but also in relation to the millions of jobs transportation provides. Transportation facilities and vehicles require manufacturers, builders, operators, and mechanics, while they also create thousands of employment opportunities in related industries, from foundries which produce steel for vehicles to insurance companies which provide automobile insurance to health care systems which treat travel-related injuries.

For all these reasons it is important for students to become aware of transportation as it affects their lives, to learn to be wise purchasers and users of transportation goods and services, and to develop skills to promote constructive use and appropriate expansion of all forms of transportation in their communities and beyond.

In particular, consumers should become informed about (1) improving and using public transportation, (2) harmonizing transportation and the environment, (3) understanding transportation safety, and (4) appreciating the importance of bicycling. By examining these four major topics, students will learn, for example: to identify the best methods for commuting to school and work; to travel, when possible, in ways which minimize adverse transportation effects on the environment; and to purchase and use transportation vehicles and facilities in the safest possible manner.

CURRICULUM MATERIALS AVAILABLE

This Manual is one in a series of volumes which treat at different grade levels the four transportation topics of Public Transportation, Transportation and the Environment, Transportation Safety, and Bicycles. These volumes were developed by Abt Associates Inc. under contract to the U.S. Department of Transportation, Office of Consumer Affairs. The following eleven Manuals and curriculum guide on transportation consumer education are currently available:

- TRAVEL ON! Mini-units and Learning Activities on Transportation for Grades K-3
- TRAVEL ON! Mini-units and Learning Activities on Transportation for Grades 4-6
- Transportation Consumer Education for Adults: Mini-units and Learning Activities
- PEDAL ON! Mini-units and Learning Activities on Bicycling for Grades 6-9
- PEDAL ON! Mini-units and Learning Activities on Bicycling for Grades 9-12
- RIDE ON! Mini-units and Learning Activities on Public Transportation for Grades 6-9
- RIDE ON! Mini-units and Learning Activities on Public Transportation for Grades 9-12
- GETTING THERE! Mini-units and Learning Activities on Transportation Safety for Grades 6-9
- GETTING THERE! Mini-units and Learning Activities on Transportation Safety for Grades 9-12
- Transportation and the Environment in Harmony: Mini-units and Learning Activities for Grades 6-9
- Transportation and the Environment in Harmony: Mini-units and Learning Activities for Grades 9-12
- Transportation Consumer Education: A Curriculum Guide for Grades K-12 and Adult

These volumes may be ordered from:

Abt Publications
55 Wheeler Street
Cambridge, Massachusetts 02138

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The United States Coast Guard

The Urban Mass Transportation Administration (UMTA)

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Special mention must be made of a curriculum guide which we used extensively for ideas and activities on bicycles. This is the Maryland State Department of Education *Teacher's Guide for Bike Basics*. We are grateful to Donald Lafond for allowing us to adapt several activities from this creative document.

We should make clear that none of the agencies or individuals cited above is in any way responsible for errors or biases in the final products.

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INTRODUCTION

WHAT'S IN THE MANUAL

This Manual is divided into *four chapters*, each one treating a different topic. The four chapters focus on

1. Bicycles and Bicycle Safety
2. Transportation Safety
3. Public Transportation
4. Transportation and the Environment

Within each chapter are *mini-units* which present different aspects of the chapter topic.

Each mini-unit consists of two components:

1. *A lesson plan* which provides a suggested sequence of learning activities
2. *Individual learning activities* which describe in detail how to implement the exercises in the lesson plan

The learning activities are designed to

- Supply detailed teaching instructions which promote maximum flexibility and adaptability
- Involve students in action-oriented exercises, such as role plays, field trips, polls, and small group discussions
- Treat affective and attitudinal issues involved in decision making and behavior, as well as promote skills for safe travel

At the end of each chapter is a section called Supplementary Activities. In some chapters, this section offers additional learning activities that may be used independently. Other chapters contain a quiz that may be used to evaluate or supplement your evaluation of an activity or an entire mini-unit.

Also included at the end of each chapter is a bibliography of suggested teacher and student materials.

Ten spirit masters are provided at the end of the Manual for use with specific activities.

HOW TO USE THE MANUAL

This Manual is designed as a resource volume of activities and background materials to be used in ways which are compatible with your needs and those of your students.

The mini-units and individual learning activities may be integrated into your curriculum at many points and to meet many purposes:

- In *social studies*, the activities enhance knowledge of one's community. They aid in understanding the importance of citizen participation in government, and they broaden the study of transportation itself.

- In *science*, the activities discuss the impact that transportation has on the environment.

- *Health and safety units*, as well as physical education classes, can benefit from the Manual's emphasis on learning skills for safe travel behavior.

- *Language arts* skills are integral to all the mini-units, since the activities are designed to develop and reinforce students' capacities to listen, speak, w[illegible] observe, and analyze.

You will find that the introduction to each chapter sums up the reason for teaching that topic in your classroom. After reading these four introductions, you will have the background to decide which chapter or chapters you will teach. In examining the mini-units in a given chapter, feel free to make substitutions or deletions in the mini-units and in the learning activities whenever that is desirable to meet your teaching objectives.*

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*Some activities which involve comparisons between different modes of transportation (for example, buses vs. subways, cars vs. buses) may appear usable only in communities in which there are other forms of transportation besides the automobile. However, students in such communities can still conduct most of these activities by imagining that their town has at least two modes of transportation or by conducting the activity as if they live in a community which provides several transportation modes.

Students need to study different transportation modes even if their own communities fail to provide more than one or two because a general knowledge of every aspect of transportation is important to all citizens in a highly technological and mobile society such as ours. On a more practical level, students may be able to benefit concretely from a study of different transportation modes if they someday move to communities where several modes are available.

Here are several methods for adapting the mini-units and learning activities to teach transportation in your classroom:

1. You can read through the lesson plans for each mini-unit in a particular chapter and *select one or more mini-units* to integrate into your curriculum. Having made your selection, read the detailed activity descriptions which follow the lesson plans for specific instructions on implementing the activities in the mini-unit or units you have chosen.

   This method of using the Manual is most appropriate if you wish to concentrate in some depth on one or more specific aspects of transportation.

2. You can also *develop your own mini-unit* consisting of activities that you select from several mini-units. If you wish to do this, read the capsule descriptions of each activity that appear on the chart on the first page of each chapter. This chart will show you, at a glance, all mini-units and activities offered in each chapter. The activities are numbered consecutively throughout the Manual from 1 to 46 regardless of chapter topic. Likewise, the mini-units are numbered consecutively from 1 to 13.

3. You can extract one or more of the individual activities from the Manual and *integrate them at appropriate points into your existing curriculum.*

4. You can *implement one or more of the activities on an informal basis* in response to concerns or interests your students express spontaneously about various transportation topics.

BICYCLES

WHY TEACH ABOUT BICYCLES AND BICYCLE SAFETY

The Problems

The use of bicycles by people of all ages has increased tremendously in the United States. Bicycle sales reached 14.1 million in 1974. In that year more bicycles were purchased than automobiles. There are 100 million bicycles currently in use. It is expected that half the nation's population will be bicycle riders by 1980.

The greater number of bicycles has increased the need to educate people about bicycle safety. In 1974 the Consumer Product Safety Commission singled out bicycles as the most hazardous product on the American market. The Commission estimated that bicycles and the equipment associated with them are responsible for 460,000 injuries requiring emergency room treatment each year, the majority of which involve youngsters. Three bicyclists are killed in accidents every day, or over 1,000 a year. There are also 1 million bicycle injuries annually, including 60,000 concussions and 120,000 fractures. Two-thirds of bicycle deaths and a high proportion of injuries involve children aged 5 to 14.

Bicycle safety education is important not only for its own sake, but also as a means of inculcating basic transportation safety principles at an early age in a relevant way. By the time youngsters secure their drivers' licenses, many of their attitudes toward safety have become ingrained and future education and experiences can do little to alter them. Most of the safety principles learned in connection with the bicycle can be transferred to use of other transportation modes, including walking, motorcycling, and automobile driving.

The increase in bicycle sales recorded over the last few years has been accompanied by rising public interest in better biking facilities. Many states and local communities are using public funds to finance bikeways and bicycle parking facilities. Better bicycle facilities in turn are creating interest in the bicycle as a viable and non-polluting, non-energy consuming form of urban transportation.

As bicycles have increased in demand and sophistication, bicycle thefts have become a major consumer problem.

Since there are now numerous types of bicycles available at a wide range of prices, financial considerations are increasingly important in the public mind. As equipment becomes more complex and expensive, maintenance and quality of repair work also become important issues for the consumer of any age.

The Solutions

Federal and state governments must promote balanced transportation by providing assistance for planning, developing, and financing of improved bicycle facilities; must enact legislation which would be of assistance to bicyclists and establish bicycle manufacturing and bicycle riding safety standards and regulations. Local governments should provide adequate and safe bicycle facilities and implement programs to curtail bicycle theft.

Citizens/consumers should become informed about bicycle safety laws and regulations and practice safe bicycling habits. They should be informed about problems associated with bicycle purchase, maintenance and use and participate in their solution.

Teachers can guide students to a better understanding of the importance of bicycle safety and the availability of adequate bicycling facilities. Classroom education and transportation consumer education can offer the student a unique opportunity to develop awareness and skills essential to acquire responsible bicycling habits and to play a role in promoting responsible family and community attitudes toward bicycling.

This chapter focuses on developing consumer skills that are particularly appropriate to grades K-3. The learning activities are designed to

- Promote awareness of the variety of uses to which bicycles can be put: recreational, shopping, commuting, visiting, and running errands
- Develop an awareness of and a positive attitude toward safe bicycling practices
- Stimulate concern for other people who ride their bicycles dangerously
- Motivate students to maintain their bicycles in safe operating condition and provide them with the necessary information to do so

BICYCLES AND BICYCLE SAFETY

Activity #	Activity Description	Class Time (periods)
	Mini-unit 1 **Learning about your bicycle**	
1	Students play a game that requires them to identify the parts of a bicycle.	1
2	Students review the basic concept of a bicycle as a vehicle and their responsibility as bicycle riders.	1
3	Students learn how to purchase and maintain a bicycle and prevent it from being stolen.	1-2
	Mini-unit 2 **Using your bicycle safely**	
4	Students learn about bicycle safety and distinguish safe from unsafe bike riding.	1½-2½
5	Students learn the meaning of traffic signs by playing two games.	1½-2
6	Students construct murals and posters displaying safe and unsafe bicycle riding habits.	2
7	Students simulate the movement of pedestrians, cars, trucks, and bicycles.	1½-2
	Supplementary Activities	
8	Students engage in one or more mini-activities on bicycle safety.	½-1 per mini-activity
9	Students answer questions on bicycles and bicycle safety.	½-1

MINI-UNITS
AND
LEARNING ACTIVITIES

MINI-UNIT 1

LEARNING ABOUT YOUR BICYCLE

Mini-unit 1 introduces students to the bicycle as a vehicle and discusses the many ways it is used. Being familiar with the possible ways to use bicycles allows students to take full advantage of the opportunities bicycling presents. This subject is covered in Activity 2. Knowing how a bike works and how one plans to use it will influence the kind of bicycle one buys. These are topics dealt with in Activities 2 and 3.

In addition to covering bicycle use and purchase, this mini-unit deals with bike maintenance and the prevention of bike theft. Either through laziness or ignorance, many youngsters fail to maintain their bicycles. Other children fail to take precautions to prevent bicycle theft. Activity 3 points out the need to care for one's bike and how to do so.

The concepts dealt with in Mini-unit 1 include

- A bicycle is a means of travel.
- Knowledge about what the different parts of a bicycle are, and what their purpose is, is essential to proper bicycle use and maintenance.
- Many things must be considered before buying a bicycle.
- To make a bicycle last as long as possible, it is important to know how to maintain it properly.

MINI-UNIT 1 LESSON PLAN

Learning about your bicycle

Activity #	*Activities*	*Class Time*
1 Spirit Masters 1 & 2.	DESCRIPTION: Students play a game that requires them to identify the parts of a bicycle. OBJECTIVE: By the end of the game, students will be able to identify five parts of a bicycle.	1 period
2	DESCRIPTION: Students review the basic concept of a bicycle as a vehicle and their responsibility as bicycle riders. OBJECTIVE: After completing this activity, students will be able to name three things that a bicycle rider should know or have to be safe while riding.	1 period
3	DESCRIPTION: Students learn how to purchase and maintain a bicycle and prevent it from being stolen. OBJECTIVE: After completing this activity, students will be able to name two important points to remember about each of the following: bike purchase, bike maintenance, and prevention of bicycle theft.	1-2 periods

Total Class
Time: 3-4
periods.

ACTIVITY #1

Mini-unit Topic: Learning About Your Bicycle **Approximate Class Time:** 1 period

Capsule Activity Description: Students play a game that requires them to identify the parts of a bicycle.

Objective:
By the end of the game, students will be able to identify five parts of a bicycle.

Concept Treated:

- Knowledge about what the different parts of a bicycle are, and what their purpose is, is essential to proper bicycle care and maintenance.

Materials Needed:
Construction or drawing paper, Spirit Masters #1 and #2.

ACTIVITY

It is important for students to know the parts of a bicycle if they are to use and maintain one properly. To learn the basic parts of a bicycle and some new vocabulary words, students play a game similar to Bingo.

Prior to playing the game, review the bicycle parts and their names with the class, using the attached bicycle picture. Discuss the function of each part. Pass out to each student a sheet of construction paper, preferably 8½" x 11", and a copy of Spirit Masters #1 and #2. Students fold or mark the construction paper into 9 blocks. They then cut out the pictures of the bicycle parts and the corresponding names for each part. All students paste the picture of the bicycle in the center block on their "Bingo" cards. Each student then chooses eight other pictures (any eight that they wish) and pastes them randomly on the remaining squares.

Slips of paper with the names of the bicycle parts are placed in a box or some other receptacle for the "caller." As the parts are called, the slips are set aside. If a called part appears on a student's card, he or she locates its name and places the name over the picture of the part. The game proceeds as in Bingo. Once a student has routed a row of numbers running vertically, horizontally, or diagonally, he or she yells "Ride On!"

The game can be played as often as time permits; students exchange cards after each game.

Variation or Supplementary Activity:

It may be simpler and less confusing to make the Bingo cards yourself and distribute them.

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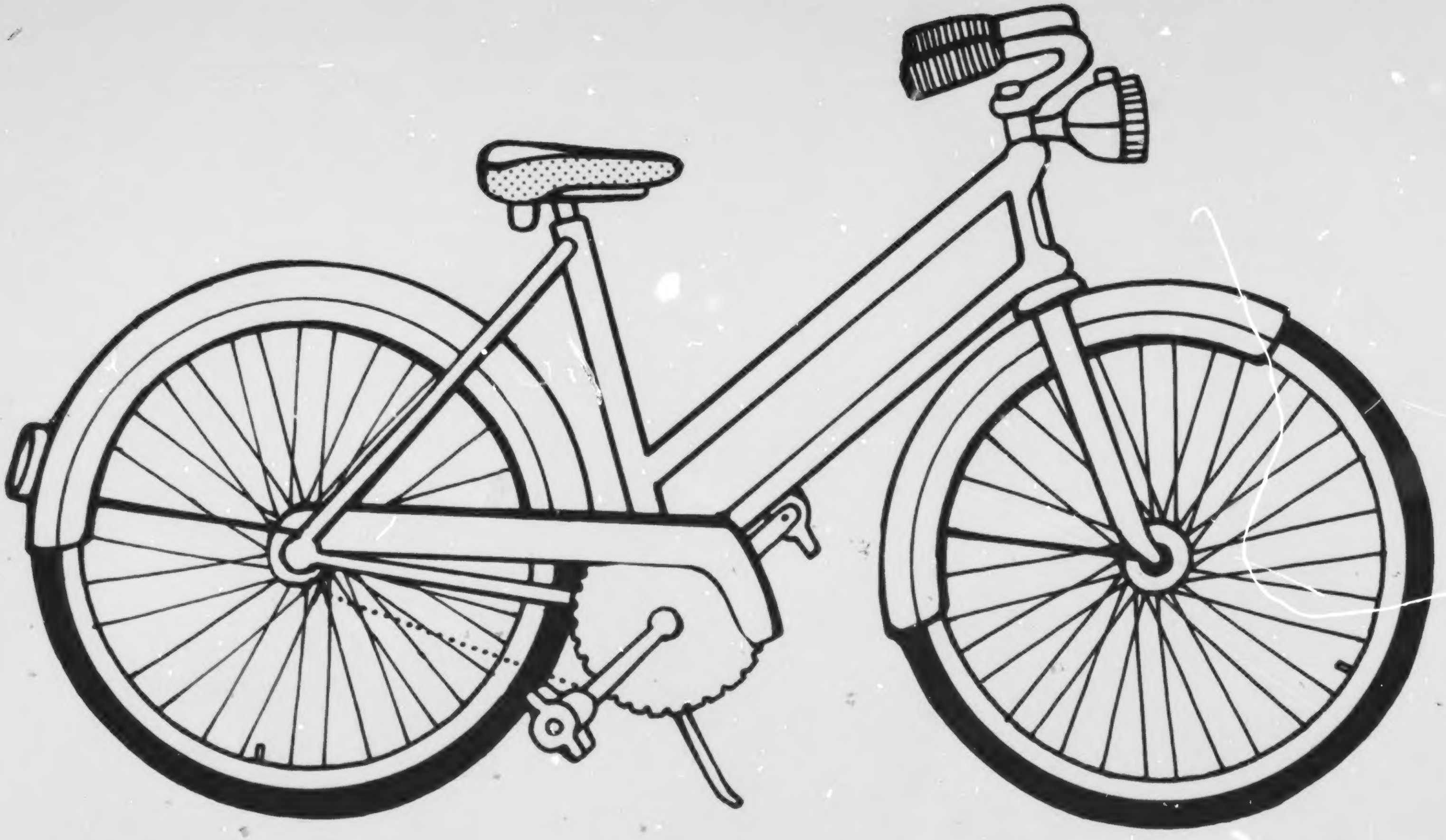

ACTIVITY #2

Mini-unit Topic: Learning About Your Bicycle **Approximate Class Time:** 1 period

Capsule Activity Description: Students review the basic concept of a bicycle as a vehicle and their responsibility as bicycle riders.*

Objective:

After completing this activity, students will be able to name three things that a bicycle rider should know or have to be safe while riding.

Concepts Treated:

- A bicycle is a means of travel.
- A bicycle is one of many vehicles which travel on land.

Materials Needed:

Old magazines, scissors, paste, large sheet of construction paper.

ACTIVITY

Students discuss what a bicycle is and is used for. Discussion can include such topics as

- Why a bicycle is considered a vehicle; the definition of a vehicle; and similarities between bicycles and other vehicles
- Why the cyclist should know the rules of the road, and which of these rules are applicable to bicycle riders
- What the cyclist must know about his vehicle (handlebar position, seat position, size for his/her height, and weight)
- What equipment is necessary for safe riding (lights, bell or horn)
- Why bicyclists should be able to recognize and follow signs and signals by their shape and color

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*This activity has been adapted from the Maryland State Department of Education *Teacher's Guide for Bike Basics*.

After the discussion, students look through magazines for pictures of bicycles and other transportation vehicles. The pictures are cut out. All the bicycle pictures are pasted in the middle of a large sheet of paper surrounded by pictures of other modes of transportation.

ACTIVITY #3

Mini-unit Topic: Learning About Your Bicycle **Approximate Class Time:** 1-2 periods

Capsule Activity Description: Students learn how to purchase and maintain a bicycle and how to prevent it from being stolen.

Objective:

After completing this activity, students will be able to name two important points to remember about each of the following: bike purchase, bike maintenance, and prevention of bicycle theft.

Concepts Treated:

- Many things must be considered before buying a bicycle.
- To make a bicycle last as long as possible, it is important to know how to maintain it properly.
- People can take precautions to reduce the chance that their bicycle will be stolen.

ACTIVITY

Invite a bicycle salesperson, a mechanic, or a representative of a local bike club to talk to your students about the proper purchase and care of a bicycle. Young students will need help in both these areas and should be instructed to seek it from parents or older brothers and sisters. Among the topics and points the guest speaker can discuss or demonstrate to the class are the following:

Purchase

1. Determining what characteristics in a bicycle the user/buyer wants, needs, and can afford
2. Shopping for the bicycle at different kinds of stores (department stores, bike shops, hardware stores)*

---

*This point should be covered by you or a bike club representative. A salesperson may not be able to be objective on this point.

3. Actually buying the bike

4. Selecting and purchasing bicycle accessories

Maintenance

1. Adjusting brakes as they wear and/or loosen

2. Lubrication (brakes, derailleur, pedals, chain)

3. Tightening bolts and screws periodically (especially handlebars)

4. Tires--checking tires and not abusing them (riding over curbs, riding double, skidding to a stop)

5. Keeping a bicycle dry and free from mud (never lay bike on ground)

Preventing Theft

1. Lock bicycle to a stationary object.

2. Lock bike out in the open.

3. Keep a record of the bike's serial number.

4. Take a picture of the bicycle to give to police if bicycle is stolen.

5. Register the bike with the police.

After the discussion, divide the class into three or more groups. Each group is assigned one of the topics discussed: purchase, maintenance, or preventing theft. Students make up a skit demonstrating some aspect of their topic. For example:

Purchase

1. How to convince a parent you need a new bike

2. How to talk to a salesperson who is trying to sell you a bike you don't want

Maintenance

1. How to care for your bicycle if ____________________ goes wrong

2. How to give your bicycle a check-up

Preventing Theft

1. What to do to prevent your bike from being stolen

2. What to do if your bike is stolen

After each skit, the students comment on the presentation and ask any questions they have. The guest speaker highlights any important points and corrects any inaccuracies.

Variation or Supplementary Activity:

If you cannot locate an appropriate salesperson or mechanic or bike club representative, a parent who is a biking enthusiast may be an appropriate second choice.

MINI-UNIT 2

USING YOUR BICYCLE SAFELY

This mini-unit focuses on safety while riding a bike. The unit defines correct bicycling practices as well as identifying unsafe and safe behavior as seen in the students' own bicycling habits. Major bicycle safety rules are discussed, and an entire activity is devoted to learning the meaning of traffic signs which are important to the safety of all people who use the roadways. The last activity in the unit asks students to simulate the interaction of various traffic elements to enable students to gain an understanding of how all vehicles and pedestrians must be aware of each other.

Among the concepts addressed in this mini-unit, the following are particularly important:

- Bicycle safety rules, if followed carefully, can prevent serious bike accidents; such rules include obeying normal traffic regulations, using or wearing special equipment, making an effort to concentrate on what the other fellow is doing on the road, and being sure to keep your bicycle well maintained and in good operating condition.

- Traffic signs help keep a bicycle rider from making mistakes and having accidents.

- Knowing correct bicycle behavior and practicing it will make a bicyclist safer.

- People must be aware of many things (other vehicles, environment, pedestrians) in order to be safe bicyclists.

MINI-UNIT 2 LESSON PLAN

Using your bicycle safely

Activity #	*Activities*	*Class Time*
4	DESCRIPTION: Students learn about bicycle safety and distinguish safe from unsafe bike riding behavior. OBJECTIVE: After completing this activity, students will be able to identify unsafe bicycle practices and indicate the correct behavior for each practice cited.	1½-2½ periods
5 Spirit Master #3	DESCRIPTION: Students learn the meaning of traffic signs by playing two games. OBJECTIVE: After completing this activity, students will be able to demonstrate knowledge of traffic signs by explaining the meaning of at least three signs common to their neighborhood or community.	1½-2 periods
6	DESCRIPTION: Students construct murals and posters displaying safe and unsafe bicycle riding practices. OBJECTIVE: After completing this activity, students will be able to point out unsafe bicycle practices in given situations and describe the appropriate safe behavior.	2 periods
7	DESCRIPTION: Students simulate the movement of pedestrians, cars, trucks and bicycles. OBJECTIVE: After completing this activity, students will be able to compile a list of the four most important bicycle safety rules that they should keep in mind when riding their bicycles.	1½-2 periods

Total Class Time: 6½-8½ periods.

ACTIVITY #4

Mini-unit Topic: Using Your Bicycle Safely **Approximate Class Time:** 1½-2½ periods

Capsule Activity Description: Students learn about bicycle safety and distinguish safe from unsafe bike riding behavior.

Objective:
After completing this activity, students will be able to identify unsafe bicycle practices and indicate the correct behavior for each practice cited.

Concepts Treated:

- Careless bike riding can be very dangerous, leading to a wide variety of potentially serious--or even fatal--accidents and injuries.
- Bicycle safety rules--if followed carefully--can prevent serious bike accidents; such rules include obeying normal traffic regulations, using or wearing special equipment, being aware of what the other fellow is doing on the road, and being sure to keep your bicycle in good operating condition.

Materials Needed:
Art materials (drawing paper and crayons).

ACTIVITY

Students who ride or have ridden bicycles are told to think of the "dumbest" or "greatest" thing they have ever done on a bicycle. Once they have thought of an incident, they describe the event in a drawing. This incident can be told in a single drawing or in comic strip fashion.

When students have finished their projects, place those that illustrate the "dumbest" things done on a bicycle on one side of the room and those that represent the "greatest" things on the other side. Each student then describes his or her incident with the help of the drawing. After each one, ask the students to place themselves in that situation and to discuss the following questions. Then record whether the class thinks the incidents were safe or unsafe.

Dumb Incidents

1. What was "dumb" about the incident?
2. Did you feel the incident was "dumb" at the time?
3. Would you ride again in a similar fashion? Why?
4. Do you think this incident was safe or unsafe? Why?

Great Incidents

1. What was "great" about the incident?
2. Did the "great" experience involve any risks? If so, what risks?
3. If there were risks, was the experience worth it? Why?
4. Do you think this great incident was safe or unsafe? Why?

After the presentations and preliminary discussions, discuss what could be done to correct each of the unsafe incidents in the drawings. To supplement your safety discussion, the following outline has been provided along with several pictures illustrating some of the do's and don't of safe bicycling.

Basic Information about Numbers, Types, and Causes of Bicycle-related Accidents in the United States

- Bicycle accidents cause the most injuries requiring emergency ward treatment each year (460,000).
- There are 1 million bicycle-related injuries a year, including 60,000 concussions and 120,000 fractures.
- Bicycle accidents cause 1000 deaths a year--three a day.
- Twenty percent of bike accidents occur in rural areas.
- Approximately 26 percent of bike fatalities occur at night.
- Two-thirds of bicycle deaths involve children aged 5 to 14 years.
- Bicyclists are not protected in spills or crashes, while auto drivers are.
- Additional safety information is provided in the Consumer Product Safety Commission report at the end of this activity.

Major Safety Rules

- Obey the laws.
- Ride with the traffic; riding against traffic can result in running into cars coming out of driveways and roads, because auto drivers do not check for traffic coming down on the wrong side of the street; running into doors opened from parked cars for the same reason; running into cars on curves, since car drivers will hug the inner side of the road and cannot see a bike rider (nor can the bike rider see the car) until it is too late; and compounding the speed of the car and the bike if they collide.
- Do not speed; speeding makes it harder to avoid pedestrians, potholes, glass, sand, drains, and other vehicles.
- Signal all turns, so that cars don't run into you as you turn.
- Don't hitch rides with other vehicles.
- Don't ride sidesaddle or on the handlebars.
- Don't weave in and out of traffic.

Special Situations and Equipment

- Use lights, reflectors, and light-colored clothing when riding at night; the French two-way armband light is especially good.
- Slow down in rainy weather to avoid skids (wet leaves are especially dangerous); brakes, especially caliper (hand brakes) ones, function poorly in wet weather.
- Wear protective helmets particularly when riding on streets and highways.
- Wear clips over long pants to keep cuffs from catching in gears; make sure shoelaces are short for the same reason.
- Avoid traffic whenever possible.
- Don't ride two or more abreast on the road; keep single file.
- Avoid bicycles with high handlebars and small wheels--they are involved in a large percentage of accidents because they are less stable.
- Avoid trying tricks such as "wheelies" (riding on rear wheel only) and "jumpies" (slamming on the brakes so the bike will fly through the air).
- Do not ride a bicycle that is too small or too large.

Concentration while Riding

- Watch for cars coming out of driveways and side streets.
- During sunsets and rainy days, be especially careful of cars because they may not be able to see you.
- Watch out for sudden moves by pedestrians.
- Listen for cars coming up behind you.
- Look out for opening doors on parked cars.
- Watch out for potholes, drains, sand, and glass.
- Be especially careful and observant at intersections.

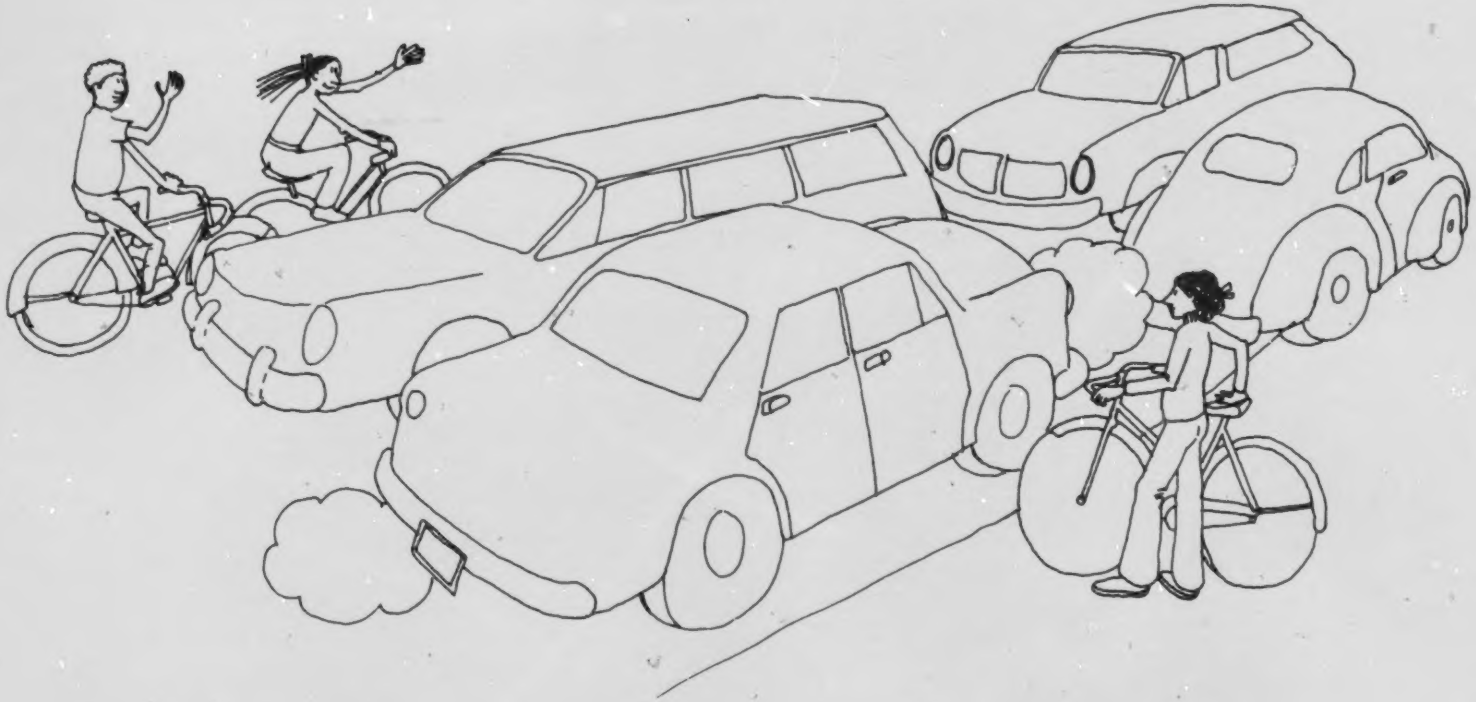
Maintenance of Bicycle

- See Activity #3, a class discussion and demonstration on bicycle maintenance. Maintenance tasks include tire care, lubrication, tightening bolts and screws, adjusting brakes, keeping bicycle dry and clean.

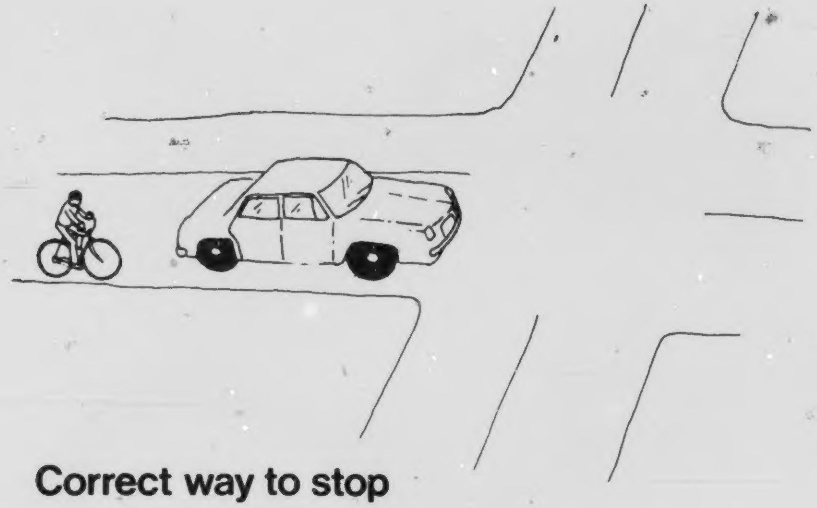
Registration of Bicycle

- In an emergency, a bike registration may help police to contact your parents or other relatives. This may also help to recover a lost or stolen bike.

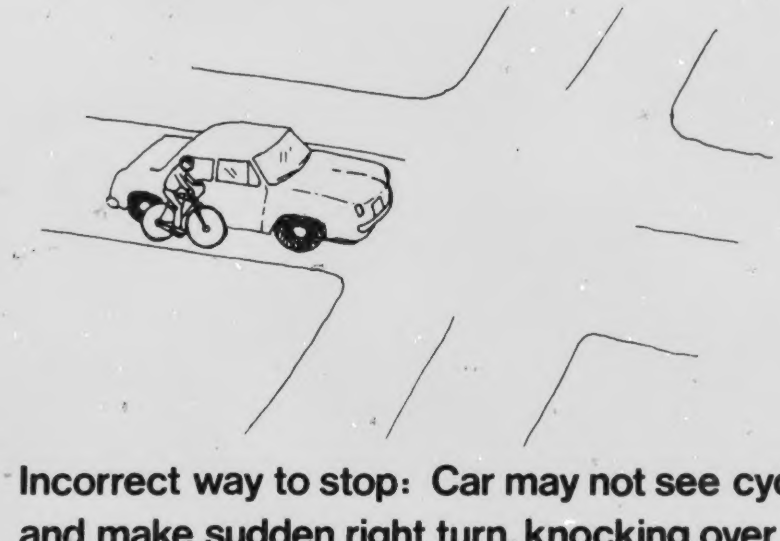
Class discussion can follow on such issues as (1) why riders commonly ignore many of these safety rules and (2) what can be done to encourage riders to practice these rules.



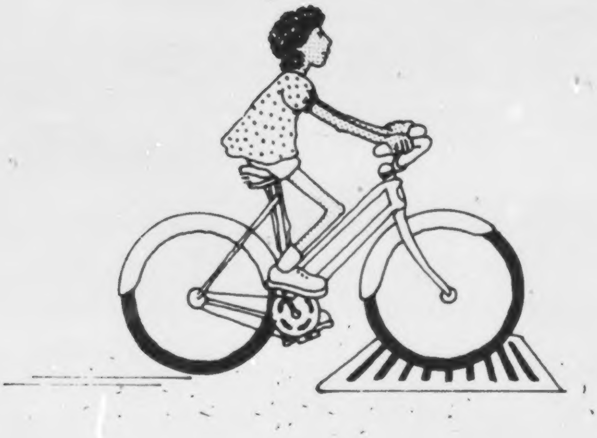
What are the bike riders doing that's unsafe?



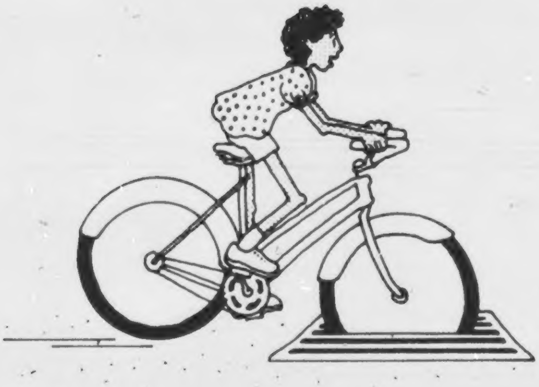
Correct way to stop



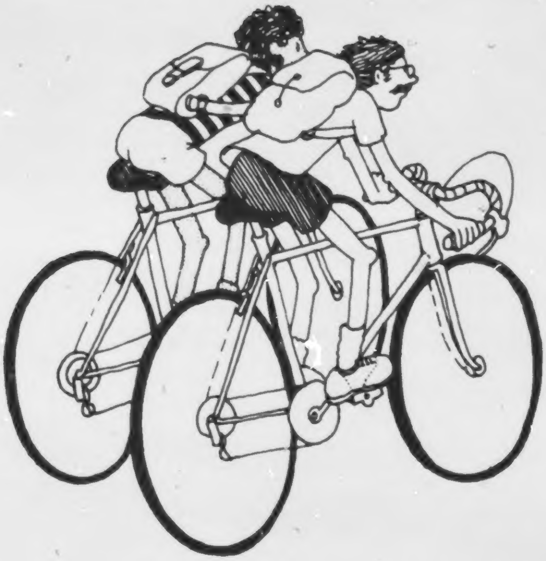
Incorrect way to stop: Car may not see cyclist and make sudden right turn, knocking over the cyclist



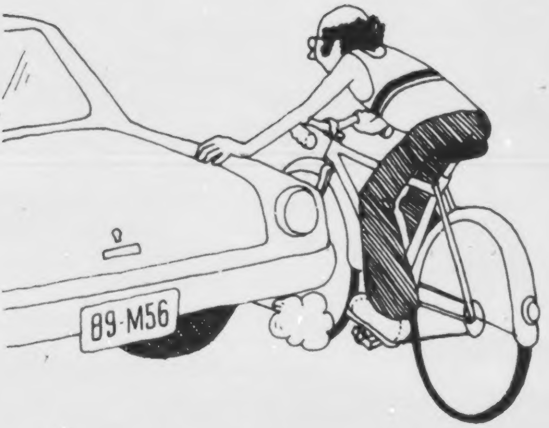
Right way to ride over gratings



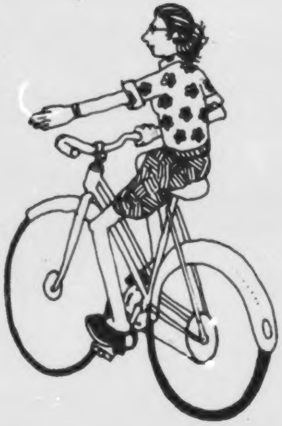
Wrong way to ride over gratings



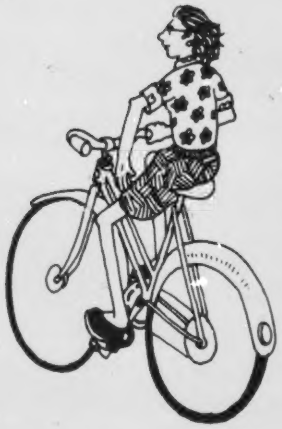
What's unsafe about this?



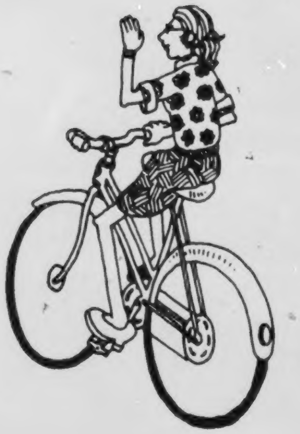
What's unsafe about this?



Left Turn

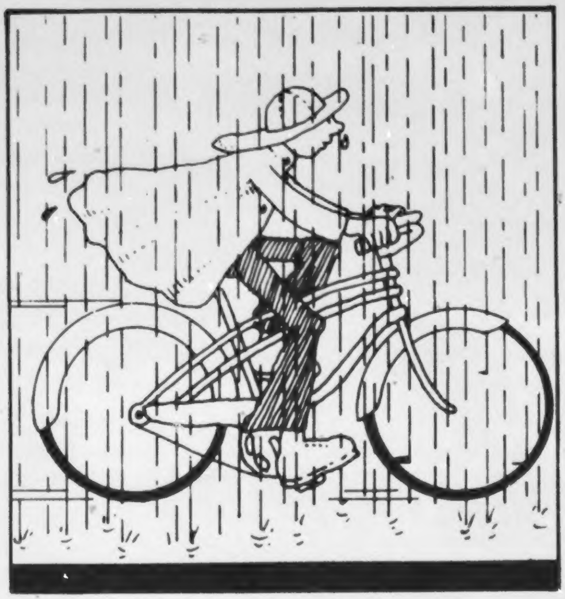


Stop

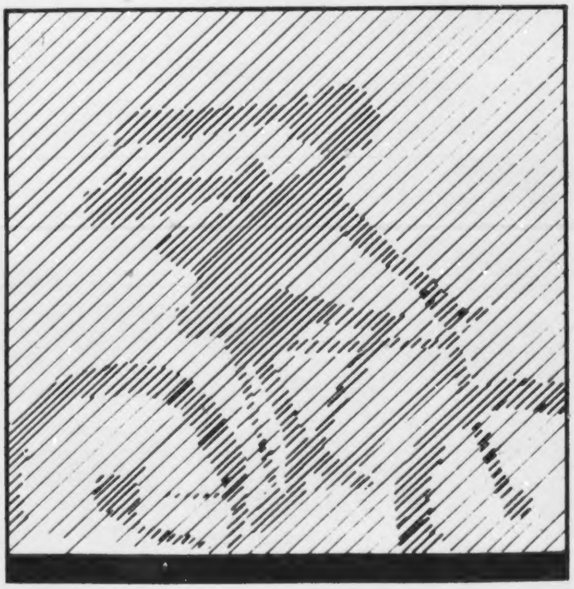


Right Turn

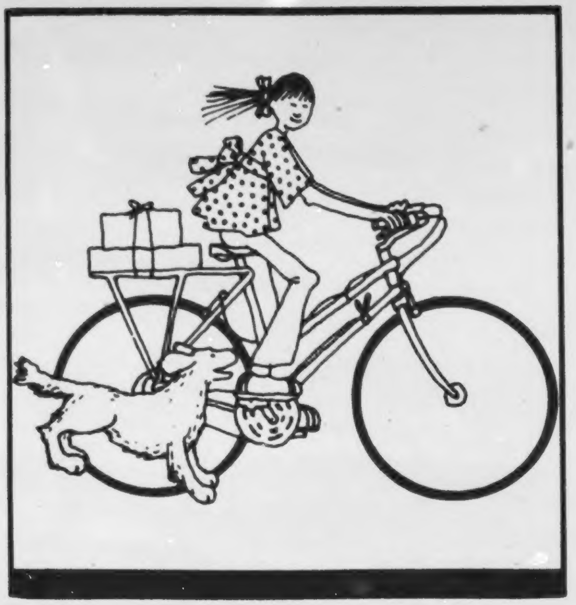
Proper way to signal turns and stops



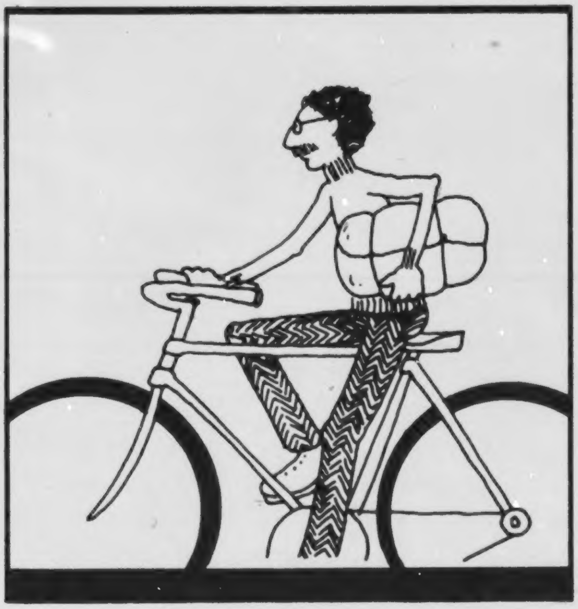
SAFE (bright clothing)



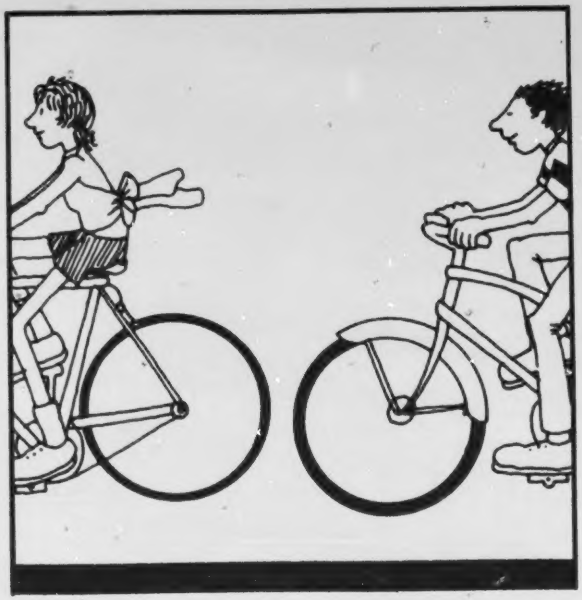
UNSAFE (wearing dark clothing)



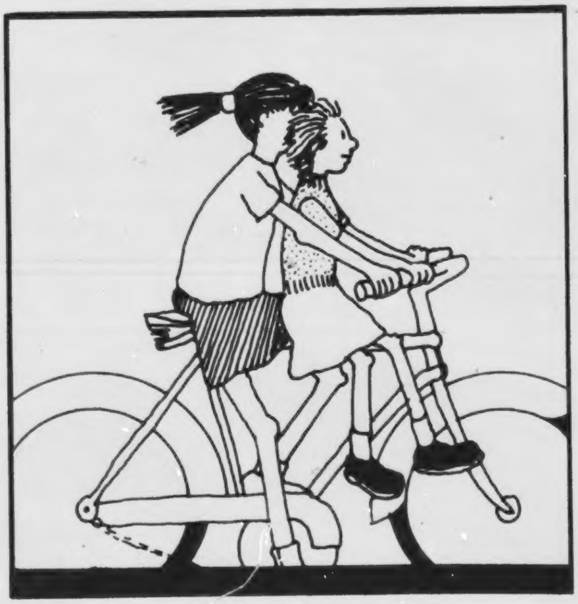
SAFE (ignoring dog)



UNSAFE (both hands not on handlebars)



SAFE (single file)



UNSAFE (riding sidesaddle)

ACTIVITY #5

Mini-unit Topic: Using Your Bicycle Safely

Approximate Class Time: 1½-2 periods

Capsule Activity Description: Students learn the meaning of traffic signs by playing two games.*

Objective:
After completing this activity, students will be able to demonstrate knowledge of traffic signs by explaining the meaning of at least three signs common to their neighborhood or community.

Concepts Treated:

- Traffic signs are helpful to drivers, pedestrians, and bicyclists.
- Bicyclists and motorists have rights and each must be aware of their own and each other's.
- Traffic signs must be obeyed.
- Traffic signs help keep a bicycle rider from making mistakes and getting in accidents.

Materials Needed:
Flashcards (attached), Spirit Master #3, cardboard.

ACTIVITY

Game 1

Show the class flashcards of various traffic signs, explaining the meaning of each one as you do so. When the class has a working knowledge of the signs, divide the students into two teams to play a game similar to a spelling bee. With the teams on either side of the room, hold up a flashcard for a

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*Game 1 has been adapted from *A Teacher's Guide to Bicycle Safety Activities and Projects* by the American Automobile Association (AAA); Game 2 has been adapted from the Maryland State Department of Education *Teacher's Guide for Bike Basics*.

member of one team to explain. If it is explained incorrectly, that student sits down and the next student on the team tries to answer it. The team which has the most students still standing at the end of the game is the winner.

Game 2

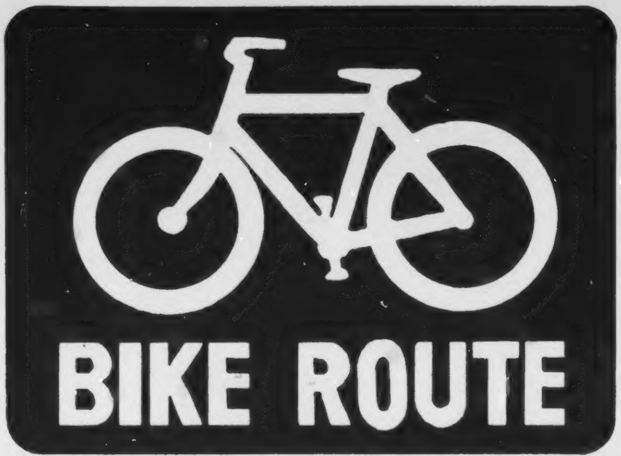
The students play a board game using blank traffic signs to learn traffic movement indicators. Explain to the students that the shape of a traffic sign offers a clue about the type of direction that the sign gives to pedestrians and drivers. With the class, review the signs on the circle: octagon--stop; diamond--caution/warning signs (curve, dip, turn, school, etc.); triangle--yield right-of-way; circle--railway advance warning sign; square--information signs, they tell you what to do; signal light--red light means "Don't go," amber light means "Don't go," green light means "Go;" crossbuck--railway crossing.

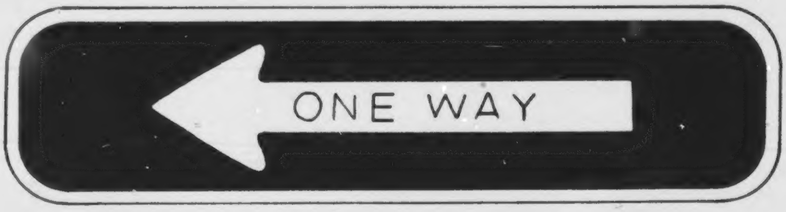
Divide the students into small groups of 3 or 4 students. Distribute the circles and arrows (Spirit Master #3) for mounting on cardboard by the groups or you might find it less confusing to distribute the game board ready-made. To play the game, the arrow is spun and the student whose turn it is must define the sign the arrow points to. A tally of correct answers is kept to decide the winner. Point values for each sign are indicated beneath the sign. This game is appropriate for both small group and large team use.

Variation or Supplementary Activity:

You can pass out copies of the sign circle to each student to color and fill in correctly with the appropriate directions or information.

Cut along lines



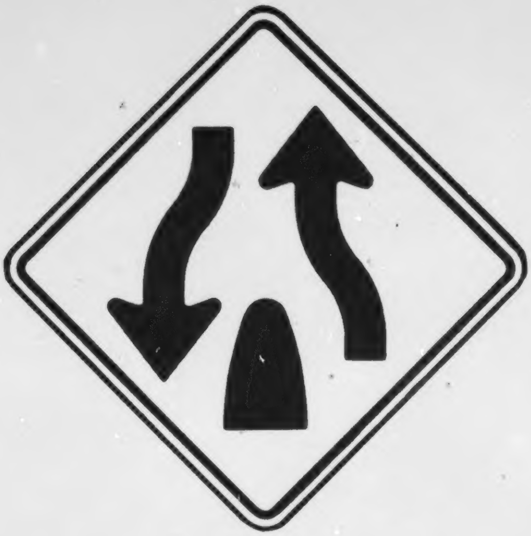


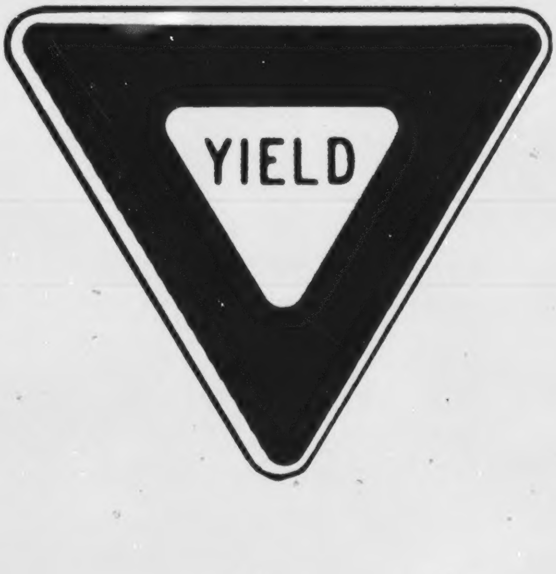
BIKE PATH PROVIDED

(roadway designated as bike route,
but no separate bike path provided)

TRAFFIC FLOWS ONLY IN DIRECTION OF ARROW

Cut along lines

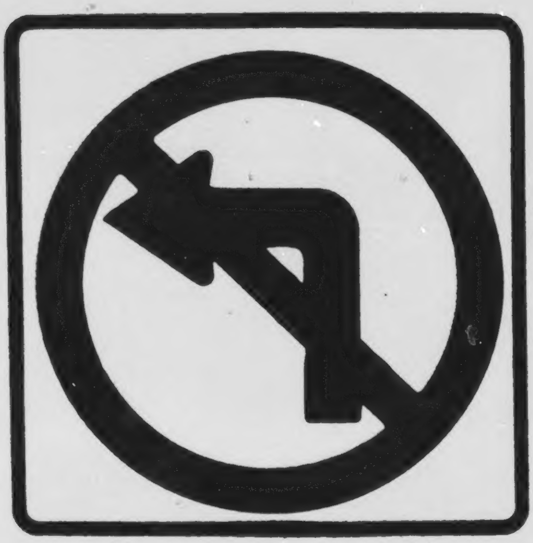


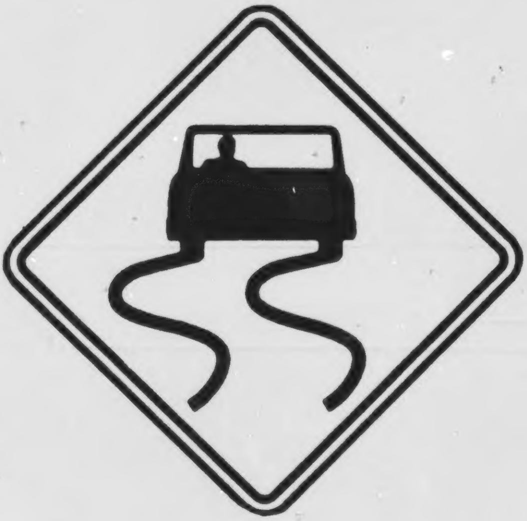


DIVIDED HIGHWAY ENDS

YIELD RIGHT OF WAY

Cut along lines

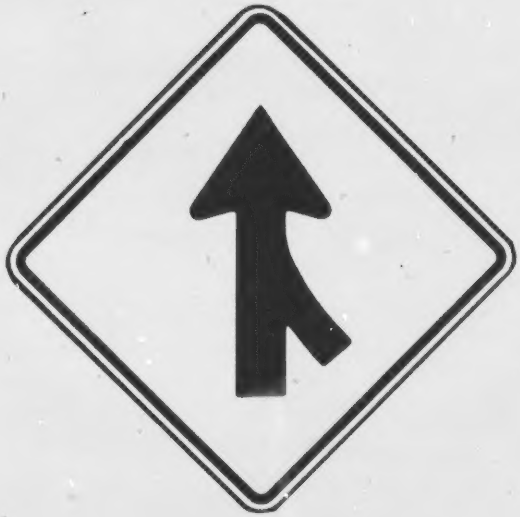


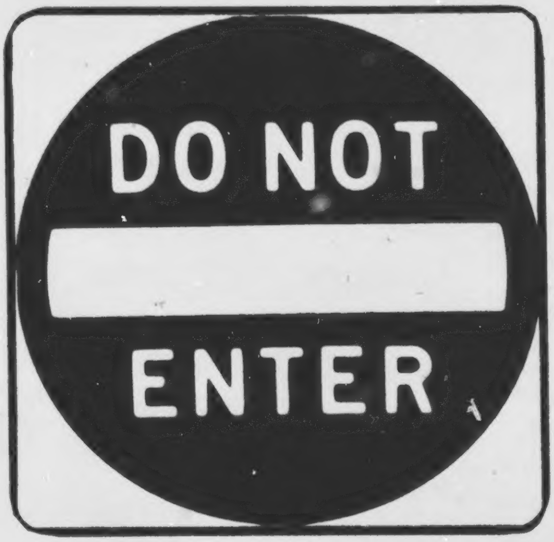


NO LEFT TURN

SLIPPERY WHEN WET

Cut along lines

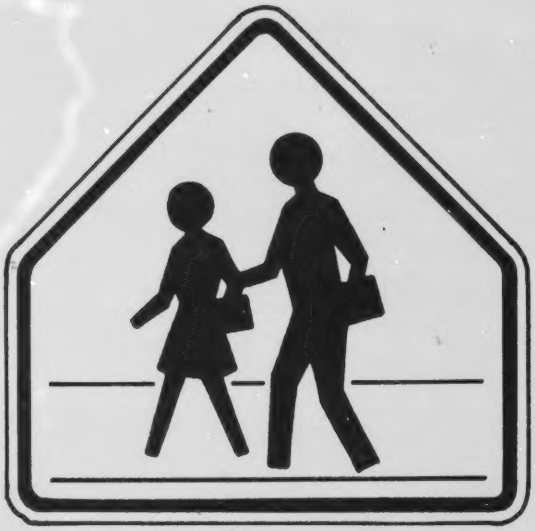


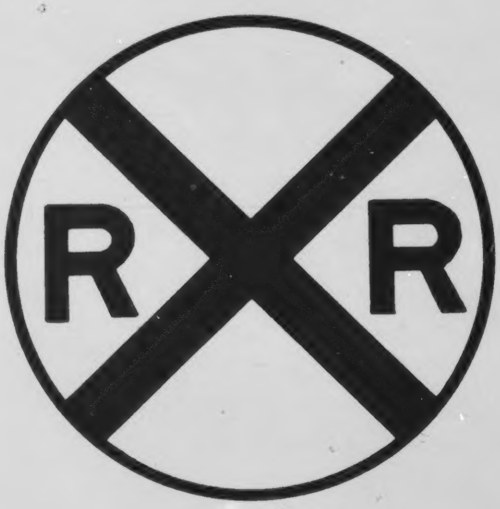

DO NOT
ENTER

MERGE

DO NOT ENTER STREET HERE

Cut along lines

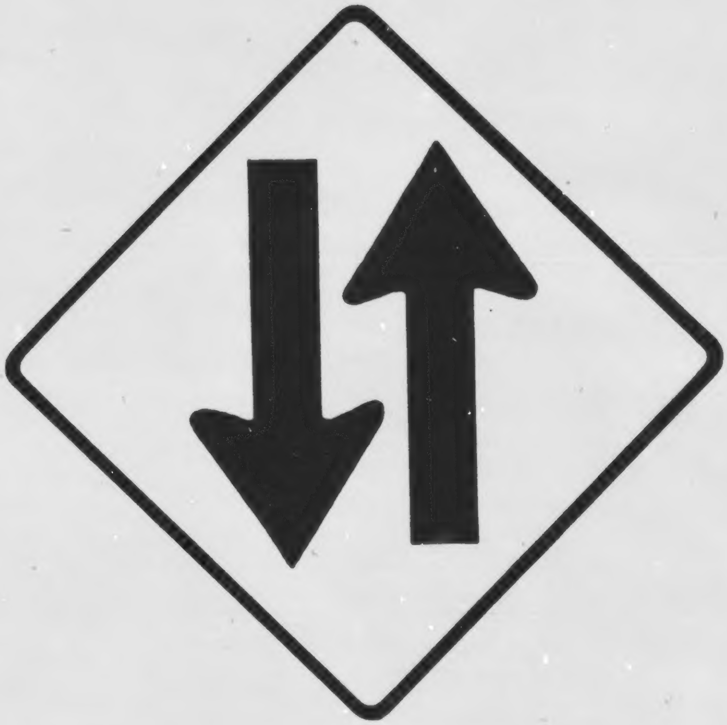


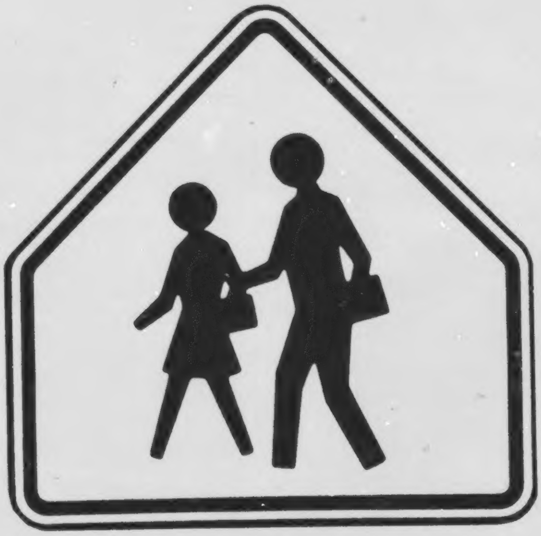


SCHOOL CROSSING

RAILROAD CROSSING

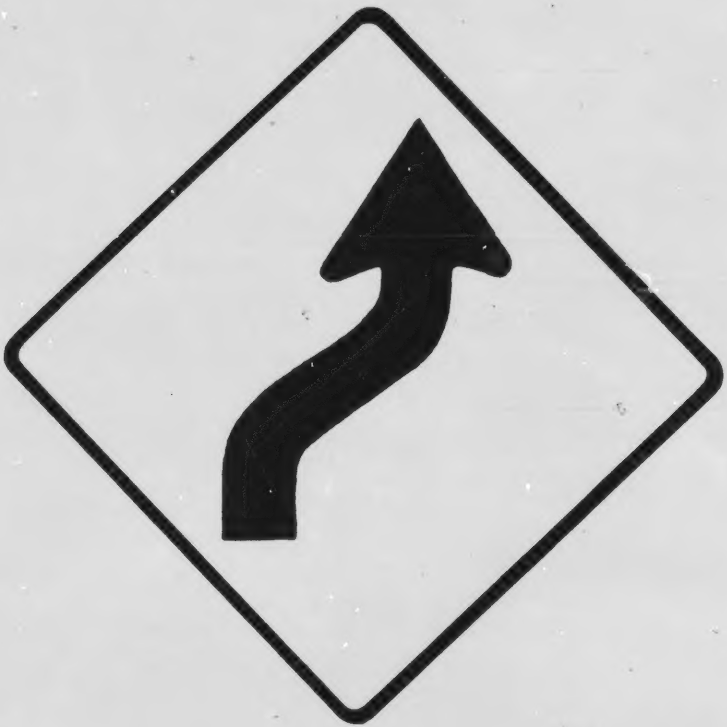
Cut along lines

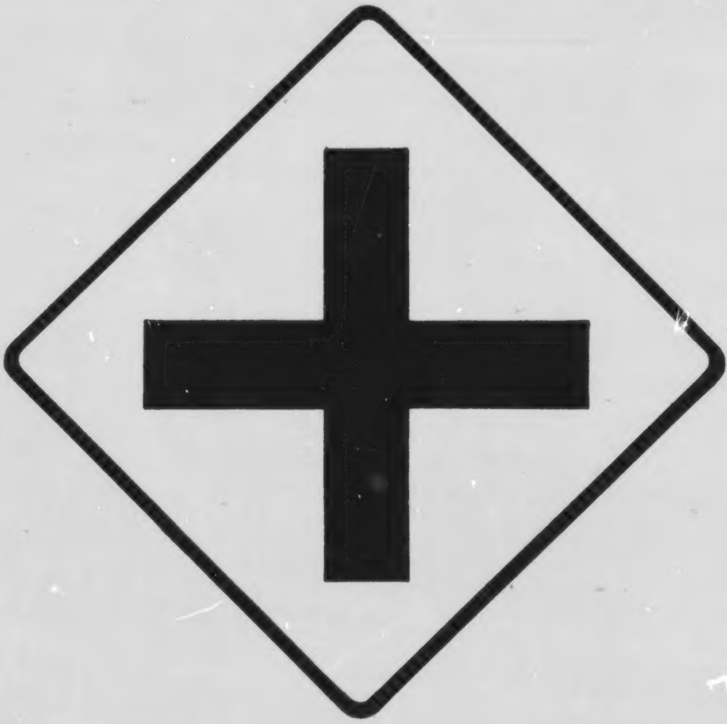




TWO-WAY TRAFFIC

SCHOOL

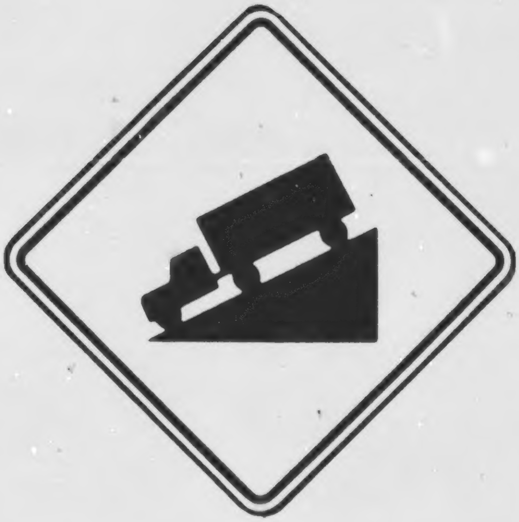


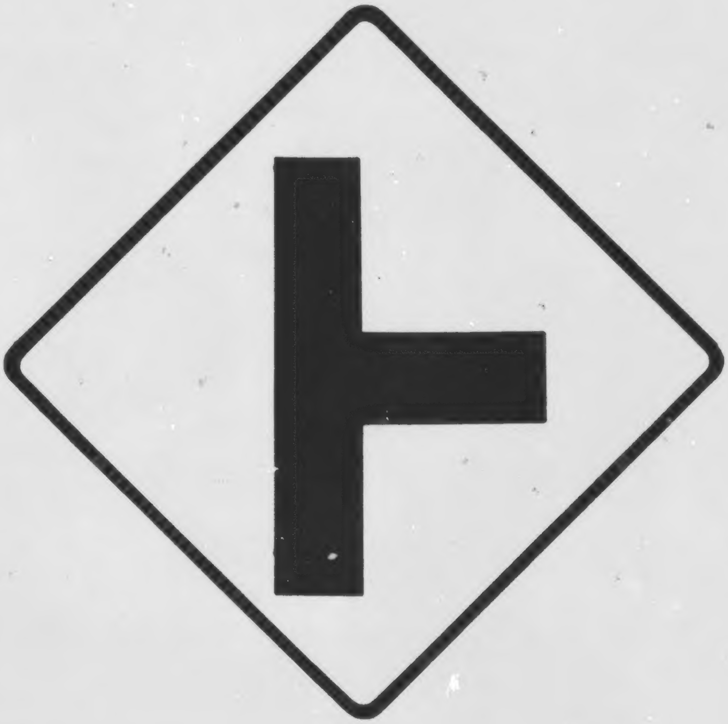


CURVE

INTERSECTION

Cut along lines

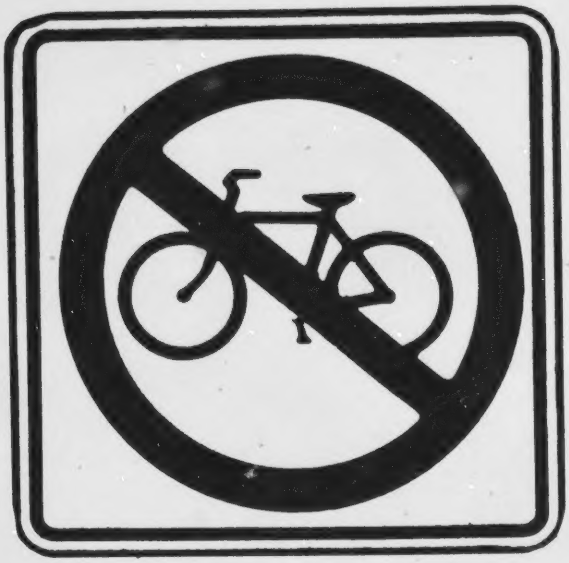


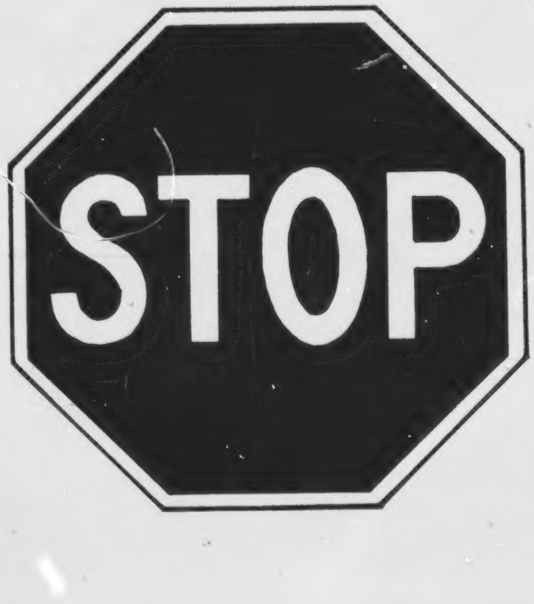


HILL

STREET ENTERING RIGHT

Cut along lines





BIKES PROHIBITED

AUTOMOBILES STOP BEFORE PROCEEDING

ACTIVITY #6

Mini-unit Topic: Using Your Bicycle Safely

Approximate Class Time: 2 periods

Capsule Activity Description: Students construct murals* and posters displaying safe and unsafe bicycle riding habits.

Objective:

After completing this activity, students will be able to point out unsafe bicycle practices in given situations and describe the appropriate safe behavior.

Concepts Treated:

- People engage in many unsafe bicycle riding habits.
- A person can become a safer bicyclist by analyzing his or her present habits and correcting those practices that are unsafe.

Materials Needed:

Art materials for making murals and posters.

ACTIVITY

Divide the class in half for the purpose of making murals and posters. Those students making murals form small groups of three or four. Each group constructs a mural depicting a neighborhood, possibly their own, including streets, sidewalks, parks, schools, homes, and stores (see example at end of activity). Pipe cleaner bicycles and riders can be shown breaking bicycle safety rules.

Those students creating bike posters may use any media with which they feel comfortable, such as crayons, chalk, paint, or colored paper. The paper should be divided in half, with one side showing the incorrect way to ride a bicycle or to handle a situation, the other half showing the correct way.

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*This portion of the activity has been adapted from the Maryland State Department of Education *Teacher's Guide for Bike Basics*.

The kinds of situations or unsafe riding practices that students can show on both the murals and posters include

- Riding double
- Riding two or more abreast
- Riding with no hands
- Riding out from between parked cars
- Riding on the left hand side of the street
- Doing a "wheelie"
- Carrying large packages on the handle bars
- Riding the wrong way on a one-way street
- Not stopping for a red light

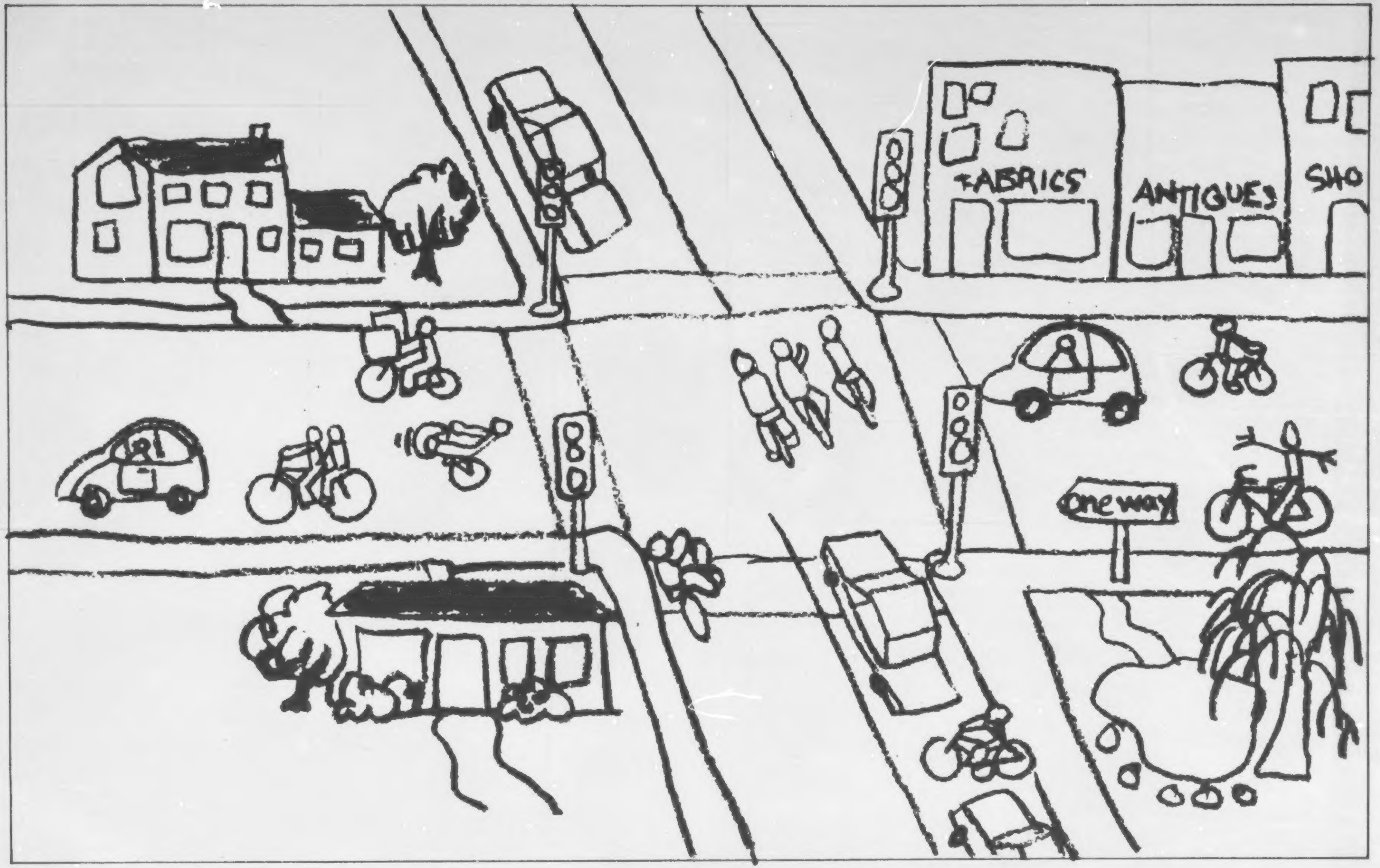
When the projects are completed, students describe their murals to the class, indicating what safety rules are being broken, why the action is wrong, and what the right action would be in each situation. Students who made posters explain why certain habits or reactions to situations on a bicycle are incorrect and what the possible result of such actions may be for the bicyclists, pedestrians, and other vehicles.

It is important not to emphasize the wrong habits too strongly, but rather to stress the importance of safe bicycle riding practices in terms of personal safety and safety of others.

Variations and Supplementary Activities:

Students can make comic strips instead of posters or murals. The first scenes show incorrect bicycling behavior, the last box shows the correct or better behavior.

Students can make a film or movie on bicycle riding habits. Several students make up a story and illustrate it. The pictures are pasted onto a roll of shelf paper. A TV is made from a large cardboard box with a screen cut out for showing the pictures. The shelf paper is put on a roller in the TV and turned to show the movie on bicycles.


FABRICS
ANTIQUES
SHO
one way

What's wrong here?

ACTIVITY #7

Mini-Unit Topic: Using Your Bicycle Safely **Approximate Class Time:** 1½-2 periods

Capsule Activity Description: Students simulate the movement of pedestrians, cars, trucks, and bicycles.

Objective:

After completing this activity, students will be able to compile a list of the four most important bicycle safety rules that they should keep in mind when riding their bicycles.

Concepts Treated:

- People must be aware of many things (other vehicles, environment, pedestrians) in order to be safe bicyclists.
- There are many reasons people act in an unsafe way in bicycling situations.

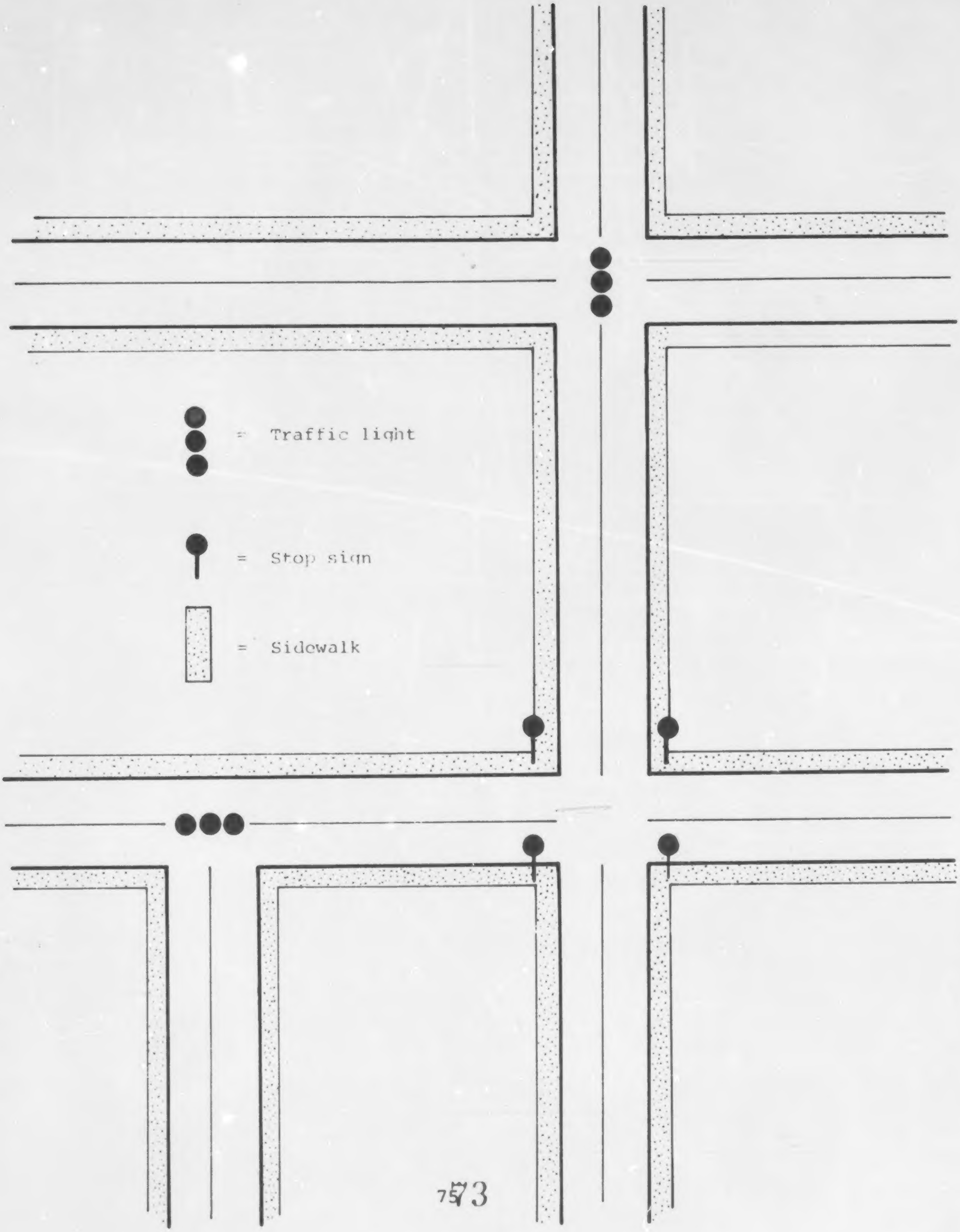
ACTIVITY

Students need to discuss bicycle safety rules before engaging in this activity. In a playground or other open area, students play the parts of drivers of cars and trucks, riders of bicycles, pedestrians, and stop lights. A classroom can be used if no larger open area is available or if the weather is inclement. Students are assigned roles or pick them, and then create and wear signs indicating their role. Roads, sidewalks and intersections are delineated by chalk lines or similar markers. Students can make their own road signs, indicating stop areas, dangerous intersections, curves, and hills. Stop lights can include words as well as colors. A sample traffic pattern is on page 75. Vehicles and pedestrians may or may not be assigned role profiles. If they are, assign them the sample profiles given at the end of the activity.

You or an older student plays the part of a police officer, evaluating the safety decisions of the actors. Bicyclists are evaluated in terms of whether (1) they kept to the farthest right area of the lane, (2) used turn signals, (3) halted at stop signs and lights, and (4) walked their bikes across intersections. Follow-up discussion centers on identifying safe and unsafe bicycling behaviors and explaining why students may have bicycled in unsafe ways, for example, did they panic? Did they not know what the safe behavior was? Did they take a risk and think they could get away with it?

Variations and Supplementary Activities:

Simulation can be replayed several times, allowing different students to play the parts of different vehicles. If an accident takes place, discussion can focus on how students should respond.


= Traffic light
= Stop sign
= Sidewalk

Sample Role Profiles

A Truck

You are a truck screaming down the highway in the right lane. Into your path comes a bicyclist who is riding in the center of the right lane. What do you do?

A Bicycle

You are a cyclist riding in the center of the right hand lane. A truck suddenly comes up behind you going very fast. What do you do?

SUPPLEMENTARY ACTIVITIES

Activity #8 which follows can be used either in conjunction with one of the mini-units or individually, by itself.

Activity #9, the last activity, suggests quiz questions you can use after teaching one or more of the mini-units or individual activities.

ACTIVITY #8

Supplementary Activity

Approximate Class Time: ½-1 period
per mini-activity

Capsule Activity Description: Students engage in one or more mini-activities on bicycle safety.*

Objective:

After completing 3 or more of these mini-activities, students will be able to respond correctly to bicycle safety questions.

Concepts Treated:

- There are many kinds of vehicles which are used for different purposes.
- To be safe and easily used, a bicycle must fit its rider properly.
- Traffic signs are helpful to drivers, pedestrians, and bicyclists.
- Knowing correct bicycle riding behavior and practicing it will help avoid accidents.

Materials Needed:

See individual mini-activities.

ACTIVITY

Students engage in one or more of the mini-activities suggested on the following pages.

Variation or Supplementary Activity:

Several of these activities can be written up on index cards and placed in a "Bikes Box" for students to work on in their spare time.

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*These activities have been adapted from the Maryland State Department of Education *Teacher's Guide for Bike Basics*.

1. To discuss vehicles, the pupils identify the vehicles in the pictures on the following pages. They discuss differences and similarities in size, shape, and construction, emphasizing the purposes of each vehicle. They list on the chalkboard the names of other kinds of vehicles that the children name.

2. The class can take a walk, paying special attention to different types of vehicles. Upon return to the classroom, similarities and differences between vehicles, such as number of wheels, number of passengers a vehicle can carry, how fast they travel, what kinds of accidents they might have, and how such accidents can be prevented, are noted and discussed.

3. The class can discuss community people who use vehicles, such as truck drivers, bus drivers, taxi drivers, delivery men, construction personnel, farmers, and bicycle riders in terms of where they travel, how fast they go, and what they have to be careful about when they drive. The teacher should emphasize that bicycles are vehicles and must follow the rules of the road just as cars, trucks, and buses must.

4. *Vehicle riddles* can be used as a learning tool.

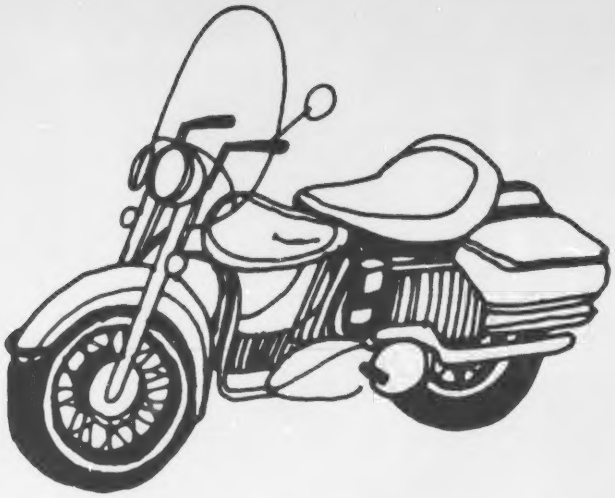
- I carry food to the city. I am very large in size. Sometimes I can have as many as 12 wheels. What am I? (Dairy truck or trailer truck)
- I love to go fast. I have a loud roar! Many teenagers love to drive me. What am I? (Motorcycle)
- I can go through red lights. I am used for emergencies. I carry sick people to the hospital. What am I? (Ambulance)
- I get paid for carrying passengers. I have a light on top. What am I? (Taxi)

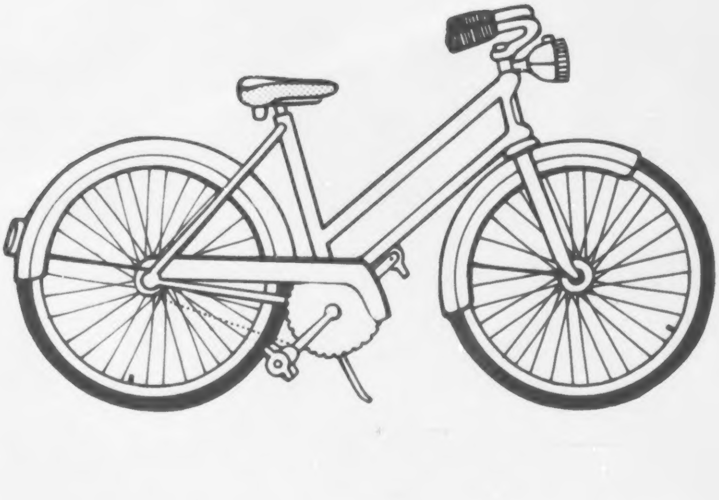
Encourage students to compose their own vehicle riddles. Class discusses other attributes of the vehicles, such as speed, dangers, and accessories. Attention is paid to comparing these attributes with those of bicycles.

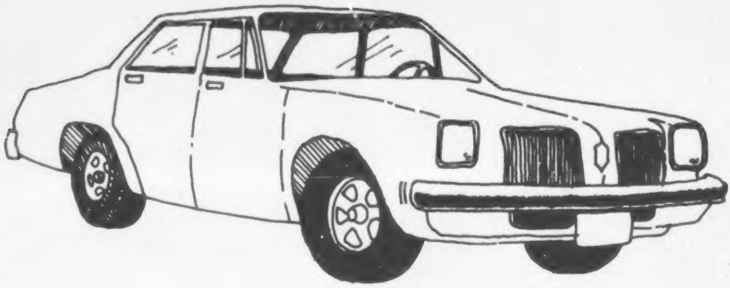
5. The students can make a list of vehicles according to where they are usually used, such as:

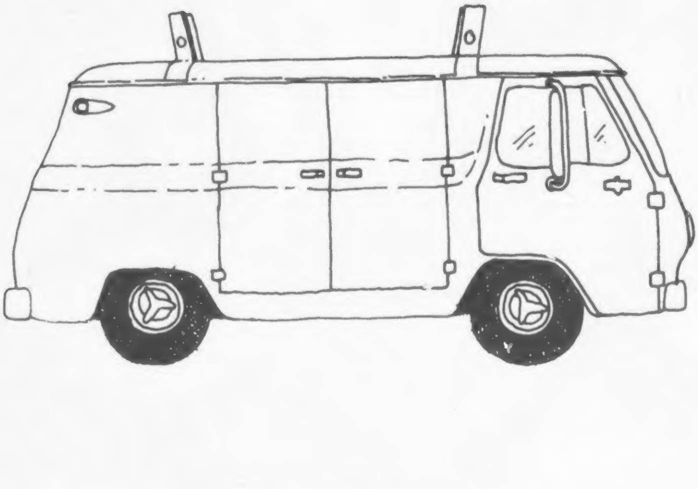
Streets	*Tracks*	*Sidewalks*	*Water*	*Air*
Truck	Train	Bicycle	Boat	Airplane
Fire Engine	Subway	Tricycle		Helicopter
Bus		Cart		Blimp
Jeep				
Car				
Bicycle				

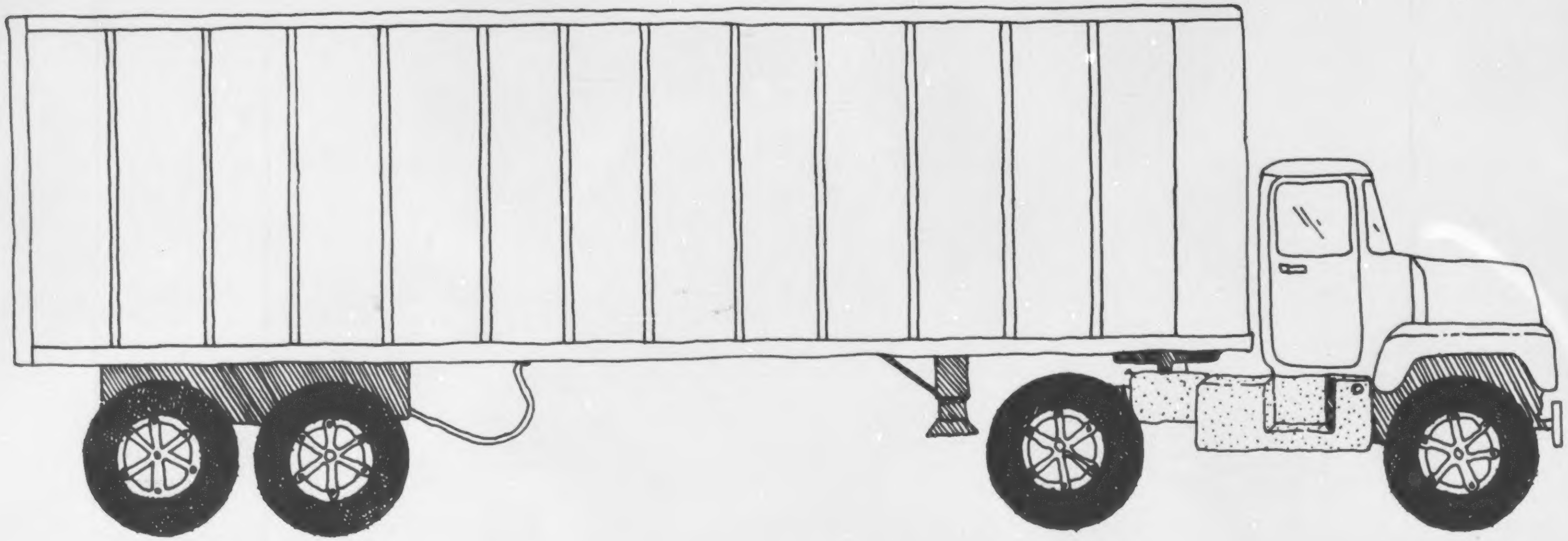
The class can discuss different hazards vehicles face in different travel environments.











6. The students respond to the following questions:

- How old were you when you got your first two-wheeler bike?
- Do you think a three-, four-, or five-year-old can drive a two-wheeler? Why or why not?
- What helps us decide when we can drive a bicycle?

7. The students circle the picture they think shows the right bicycle height for a good bicycle rider. Why choose that one? (See pictures on following pages.)

8. The students can discuss the following:

- Why is a good handlebar position especially important?
- Which position would you choose? Why?
- Discuss the importance of both angle and height. Handlebars must be of a design or in a position that allows the handle grips to be at a right angle with the fork (front wheel support) or parallel with the ground. The body should be inclined slightly forward.

9. The students can paste pictures of bicycles, bicycle situations, and bicycle facilities on heavy cardboard and cut up cardboard to make jigsaw puzzles. Magazine or student-made pictures can be used. Pictures could include accidents, examples of unsafe riding practices (riding on handlebars, etc.), bicycle games, and bicycle parts (wheel, handlebars, etc.).

10. The teacher or students make differently shaped traffic signs without words which can then be flashed to test knowledge of what each sign shape indicates. Students and/or teacher give examples of where they might find each type of sign and why.

Octagon--Stop

Circle--Railroad crossing, advance warning

Crossbuck--Railroad crossing

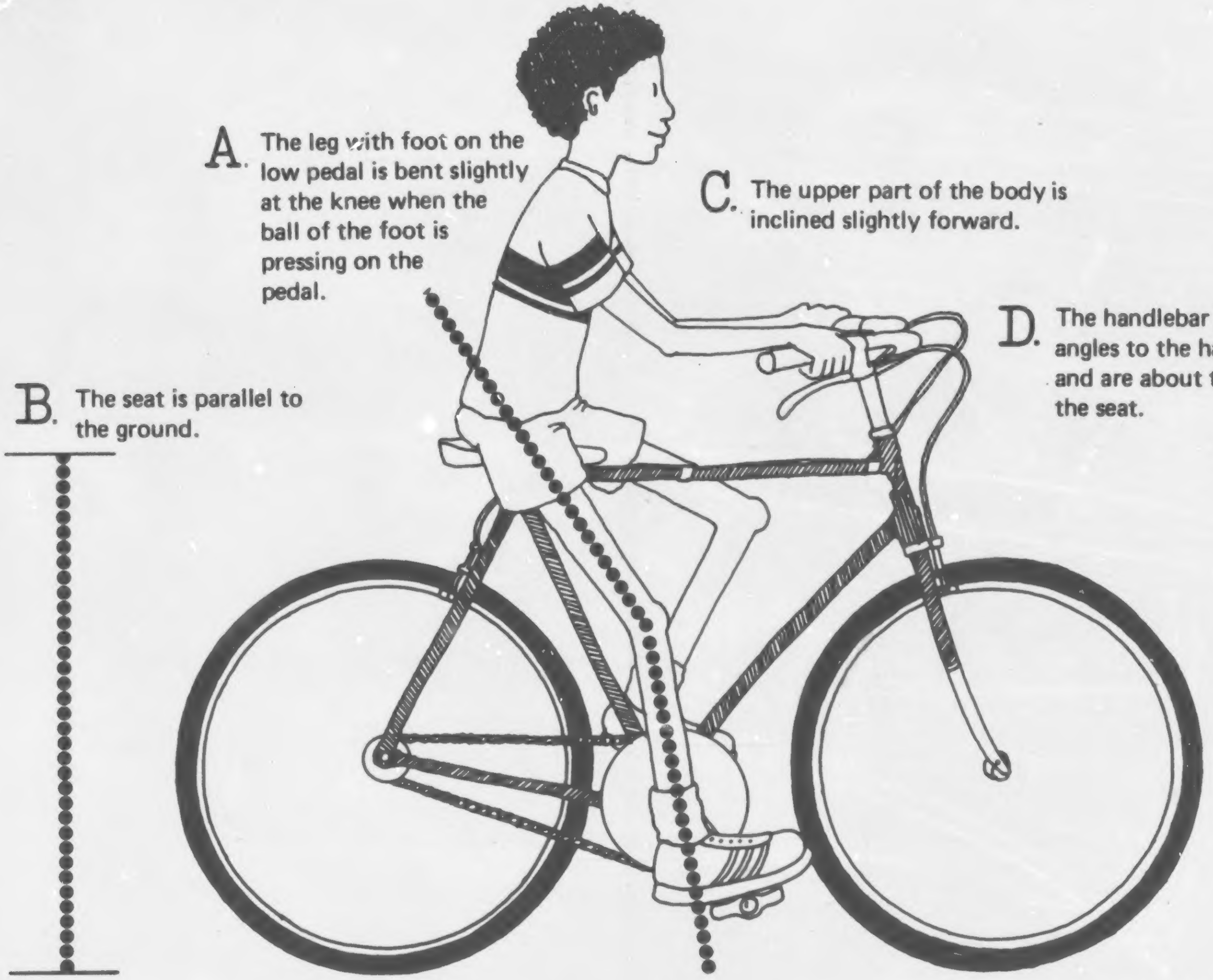
Diamond--Caution, slow down

Triangle--Yield right-of-way

11. As a bicycle driver, what message does the shape of the sign on the top of page 87 give you?

1. Slow down

2. Stop



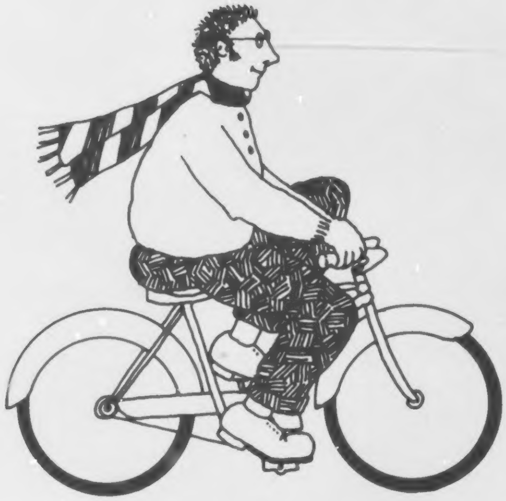
A. The leg with foot on the low pedal is bent slightly at the knee when the ball of the foot is pressing on the pedal.

B. The seat is parallel to the ground.

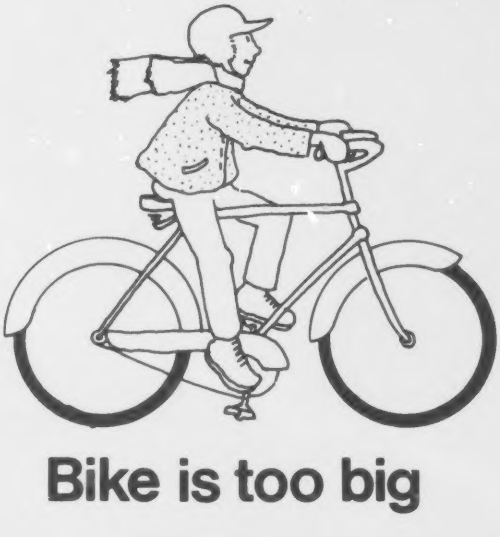
C. The upper part of the body is inclined slightly forward.

D. The handlebar grips are at right angles to the handlebar stem, and are about the same height as the seat.

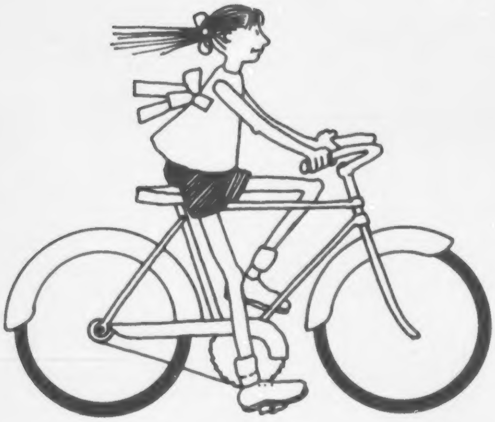
Selecting proper size bike



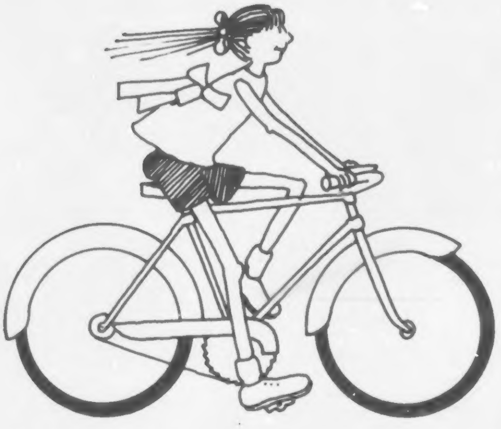
Bike is too small



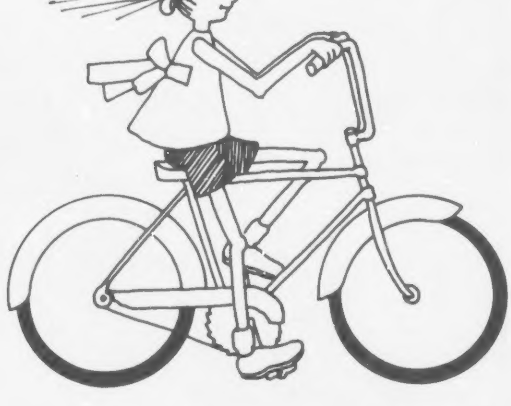
Bike is too big



Bike size is just right



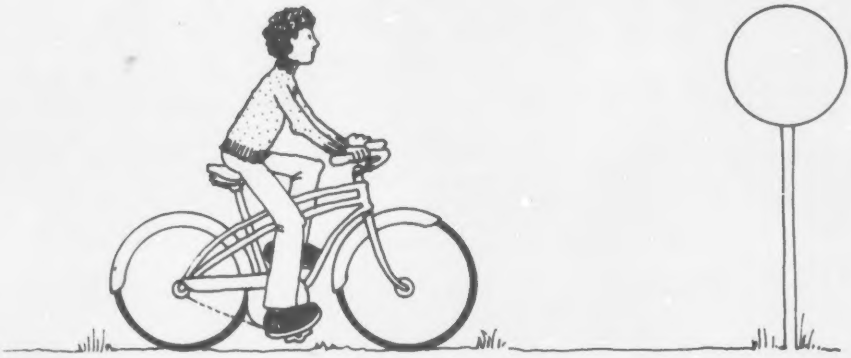
Handlebars are too low



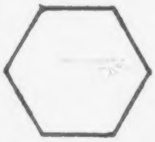
Handlebars are too high

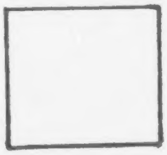
3. Right turn

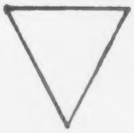
4. Railroad crossing



Here are some other signs. Can you match the "shape" with the meaning?


(1)

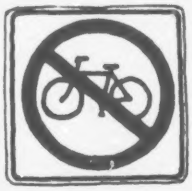

(2)

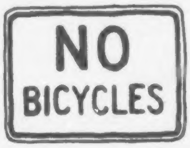

(3)

( ) Yield
( ) Stop
( ) Information

The students can trace the shape of the sign with their finger and name the shape and then identify the sign. Children also try to identify the color of the sign as well as the shape.

12. The students can discuss why a NO BICYCLES sign may be posted on a street, park, etc. Possible reasons can be: heavy traffic, construction, or high speed traffic. Students discuss what might happen if they rode bikes in these areas.





13. To further discuss signs and signals, compare them to a secret code. If someone can't understand the meaning of the sign or signal, then he cannot break the secret code or know what message or instruction he must follow. In this connection, students can discuss

1. What would happen to vehicles if people did not know what red, yellow, and green meant?

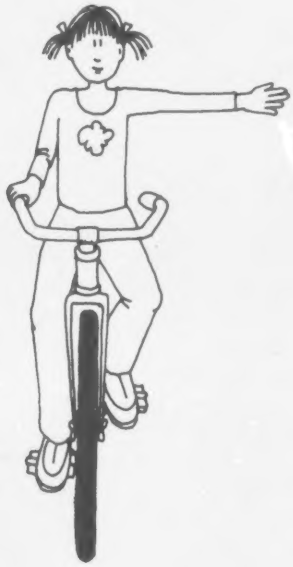
2. If someone traveled in a strange country and couldn't understand the language, how would he know what to do when he saw a light?

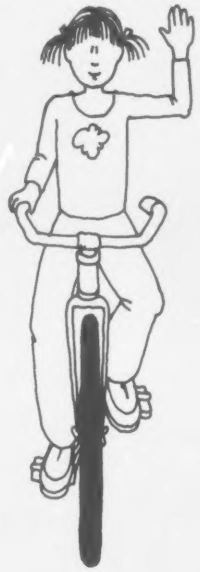
3. What might happen if all the countries in the world had different colored lights to mean different traffic signals?

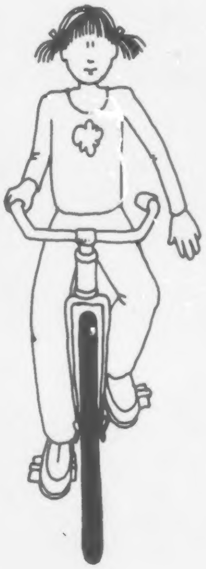
The students can create their own shapes and light designs to send a specific message.

14. Signal puppets can be made to illustrate hand signals. Students make a pattern of a bicycle and its driver. A separate pattern should be made of the left, or signal, arm. The children may then trace the patterns on cardboard, paint or color a puppet, and attach the arm to the figure with a brad. The movable arm allows them to demonstrate their knowledge of hand signals.

15. Students identify which hand signal the bicycle driver is giving in each of the pictures below. What is the difference between the way an automobile driver signals and a bicycle driver signals? Review right hand and left hand identification by acting out the situation.







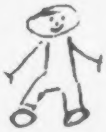
16. Students discuss where a bike rider should stop at an intersection with traffic and why. Draw intersections on blackboard and students mark the spot. See sample on the next page.

17. Students are given reproduction of the illustration for Activity #6 and identify and circle laws or rules being broken. Students then discuss why each bike behavior is undesirable.

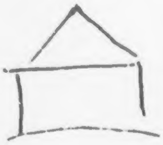
18. Students unravel and put into comprehensible order scrambled sentences such as the examples below. Students then create scrambled sentences of their own and exchange them.

Scrambled	*Unscrambled*
Means stop red flashing	Flashing red means stop.
Yellow caution means flashing	Flashing yellow means caution.
Signal on stop red	Stop on red signal.
Right always ride on the	Always ride on the right.

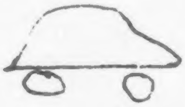
19. Students write a bicycle rebus story using pictures and words. Younger students can develop individual rebus sentences. Examples of picture words useful for this activity follow:



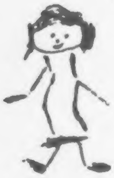
Boy



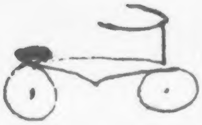
House



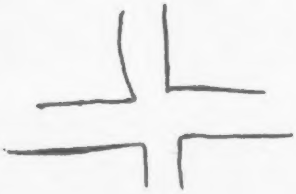
Car



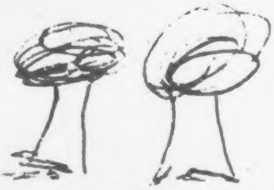
Girl



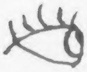
Bicycle



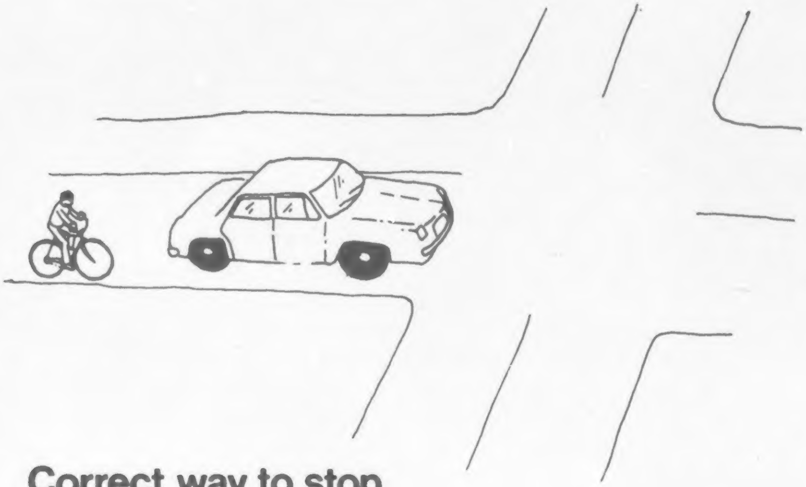
Intersection



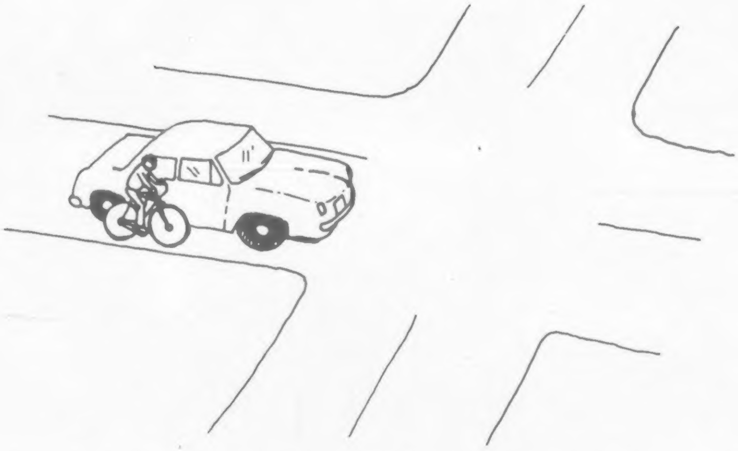
Trees



Eye



Correct way to stop



Incorrect way to stop: Car may not see cyclist and make sudden right turn, knocking over the cyclist

20. Describe the following decision-making safety situations to the class; students respond to them. Reasons for responses are then discussed. Students can create their own safety situations for each other to respond to.

Bicycle accessories: Suppose you are riding your bicycle and meet a friend. Your friend is carrying large packages and asks you to fit them in your basket. You find the packages are too large for your basket and block your view. What would you tell your friend? Your friend then asks you to ride him on your bicycle. What could you tell him?

Blind person and guide dog: A blind person using a guide dog or a cane has not yet stepped into the intersection. You are riding on your bicycle and can easily pass them before they walk into the intersection. What should you do? (When approaching a blind person on a bicycle, always come to a full stop.)

Crosswalks and when to use them: Suppose you are riding to school and come to the crosswalk directly in front of the school. What is the best way to get to school? (Ride the bicycle to the crosswalk and walk it across the crosswalk as a pedestrian.)

Emergency vehicles: Suppose you are walking your bicycle across an intersection and an ambulance is flashing its light. Do you know who has the right-of-way? Would you know what to do? (The emergency vehicle always has the right-of way.)

If signals didn't work: Suppose you are riding with mother in the car. Suddenly her directional signals do not work. What can you suggest she do? (Use hand signals which are the same for automobiles and bicycles.)

Making turns: Suppose you are riding your bicycle single file. A friend joins you and he is riding behind you. You want to make a right turn to get to school. You are in the right lane. What is the best way to make your turn? (A right turn is made from the right lane into the right lane, close to the curb.)

Riding with distractions: Suppose you are riding your bicycle and notice the drivers of other vehicles are looking at you. Some of them are beeping their horns at at you. What must you be doing wrong? (Riding on the wrong side of the street; riding against traffic.)

Riding with friends: Suppose you are meeting your friends to play ball in the park. Three of you come there on your bicycles. After play, you want to go to the candy store for sodas. You have a lot to talk about and all three of you ride along beside each other. What rule are you breaking? (Always ride single file.)

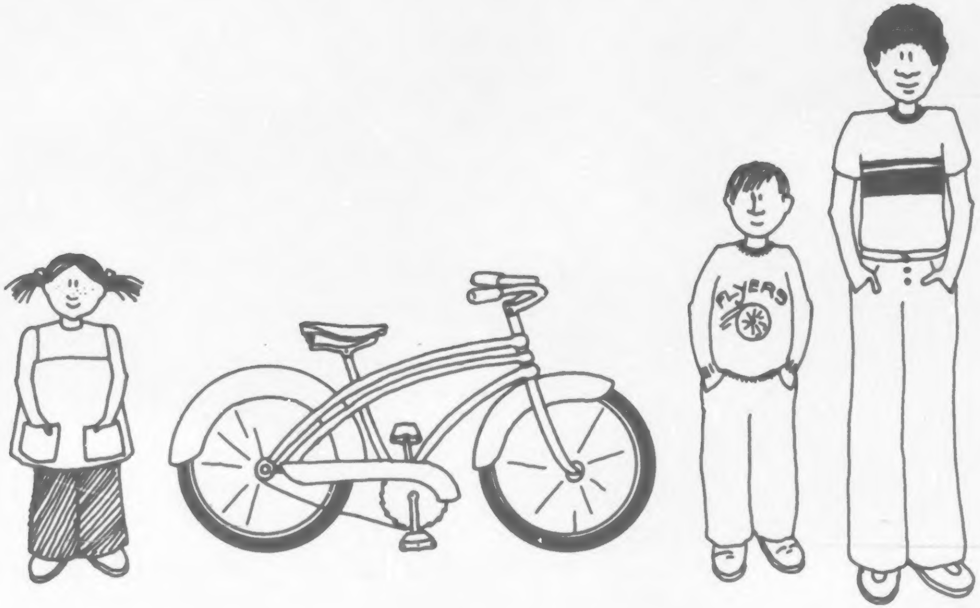
Riding on right side of road: Suppose you are riding your bicycle in the street. The left lane is clear, while the right lane is busier. Should you change over to the left lane? (You should always ride on the right side of the street or lane.)

Right-of-way: Suppose you are on your bicycle and about to enter a busy street. As you come to the corner, you see a yellow yield sign. A car is about to pass on the street you are entering. Your vehicle came to the corner first. Which vehicle has the right-of-way? (A driver must slow down and stop if necessary, yield to other vehicles, and enter only when the street is clear.)

Your bicycle and pedestrians: Suppose you have stopped your bicycle for a red light at an intersection. The light has changed to green and it is your signal to go. A pedestrian is halfway through the crosswalk. What should you do? (The bicycle driver must stop for pedestrians when they are crossing in crosswalks.)

21. To discuss correct bicycle size, instruct students to draw a picture of a bicycle on 9" x 12" manilla paper, and then cut it out. Have them draw and cut out figures of small, medium, and large proportioned people. Then cut a slash from the ankle to the knee on each of the figures. These may be placed on the bicycle that they have just made. From this, students can see how a bicycle doesn't fit everybody the same way. Stress the fact that friends and family members are different in size, and that this must be taken into consideration when allowing other people to use a bicycle. See the sample diagram on the next page.

22. You can also have a student bring his bicycle to the classroom and have the others sit on it. Ask the class to compare the bicycle to each student and discuss if it is a good fit.



For whom will this bike be the right size?
How can you tell?

ACTIVITY #9

Supplementary Activity Approximate Class Time: ½-1 period

Capsule Activity Description: Students answer questions on bicyles and bicycle safety.

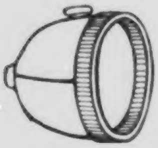
Objective:
To evaluate what students have learned during their study of bicyles.

ACTIVITY

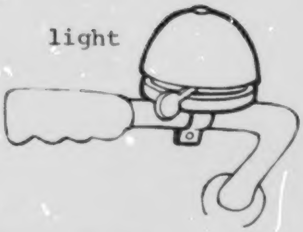
A series of questions on bicyles and bicycle safety follow. You will want to choose only those questions which treat aspects of bicycles and bicycle safety which your students have studied. These quiz questions can be used to evaluate a mini-unit or to supplement the evaluation methods included in the objectives statement at the beginning of each activity.

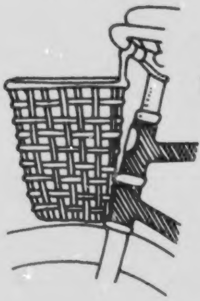
1. Circle the pictures of the things that are good to have on your bicycle.

bell

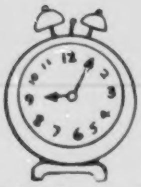


light

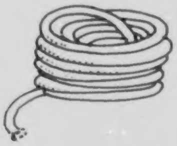




basket



clock



rope

2. Make a happy face in the circle ☺ if what the sentence says is safe. Make a sad face ☹ if what the sentence says is unsafe.

(a) When you ride your bike at night, wear light colored clothing. ○

(b) It is okay to ride next to each other on a road. ○

(c) When your bike gets wet, make sure the brakes are dry before you ride it. ○

(d) Riding over a curb is okay as long as you go slowly. ○

(e) So it won't get stolen, lock your bicycle to something that can't move--like a tree. ○

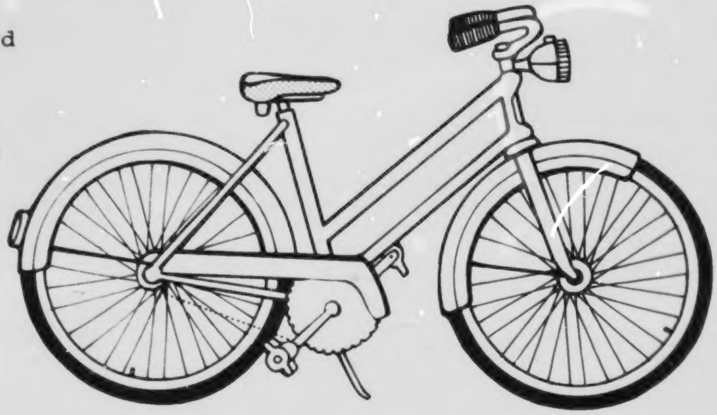
(f) It is okay to carry somebody on your handlebars as long as the person is small. ○

3. Here is a picture of a bicycle with the names of some of its parts. Draw a line from the name of the part to the place where you see it on the bicycle.

Chain guard

Pedal

Handlebars

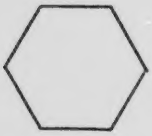


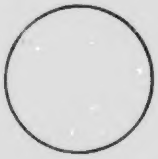
Light

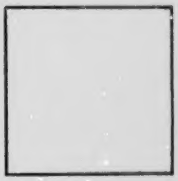
Spoke

Fender

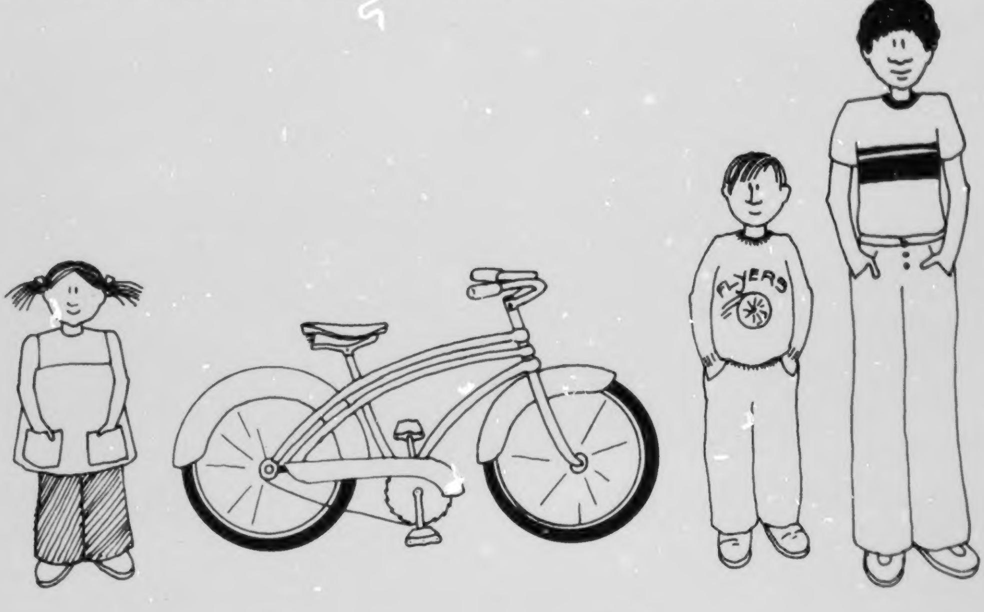
4. The shape of a traffic sign gives a hint about what the sign means. Complete each sign by writing in the word that tells you what the sign means. Use the words: DO NOT ENTER
STOP
RAILROAD







5. Draw a circle around the person who should ride the bike.



6. Use the words to fill in the blanks.

Work
Hands
Right
Traffic signs
Ground

(a) You can hurt yourself if you ride with no _______.

(b) You should always stand your bicycle up. Never lay it on the ______________.

(c) A bicycle can be ridden to get you to _______ or it can be ridden just for fun.

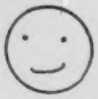
(d) Always ride on the ________ side of the street.

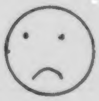
(e) _______________help us to stay safe.

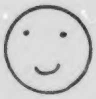
7. Draw a picture of something *you* do on your bicycle that you know is unsafe.

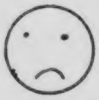
Answers

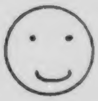
1. Light
   Bell
   Basket

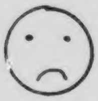
2. (a) 

   (b) 

   (c) 

   (d) 

   (e) 

   (f) 

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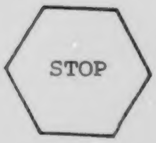
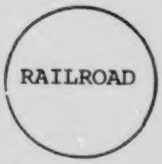
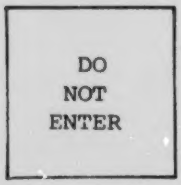
4. 




DO
NOT
ENTER

5. The little boy

6. (a) Hands
   (b) Ground
   (c) Work
   (d) Right
   (e) Traffic signs

BIBLIOGRAPHY

BIBLIOGRAPHY

The bibliography contains educational materials for classroom use and for use by teachers in developing relevant units of study on bicycles and bicycle safety. It consists of selected

- Curriculum materials
- Bicycling books
- Audiovisual materials
- Periodicals
- Sources of additional materials for teachers

The individual entries in the curriculum materials and audiovisual materials sections are presented in the following format:

**	*Title of Work*, author, date of publication. Number of pages or list of materials. Price.
Type of Material	Description of material with evaluation of material's quality and relevance for transportation consumer education.
	Source from which material may be obtained.*

For purposes of convenience, the curriculum materials have been rated by the designation of stars next to the material description. (See sample above.) The stars represent the author's evaluation based on the following scale:

No stars:	material is useful, but fair
(*) One star:	material is good
(**) Two stars:	material is very good
(***) Three stars:	material is excellent

It should be kept in mind that these evaluations are an estimation of the material's *quality and relevance*.** As such, the absence of a teaching material or a low rating does not per se indicate the material is poor. It may be excellent but simply not relevant to the Manual's content. In addition, any absences may be due to the authors' oversight.

At the end of the Manual is a list of government agencies which can be contacted for further information about bicycles and bicycle safety.

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*Allow ten weeks for delivery of items ordered from U.S. Government Printing Office.

**A complete discussion of the criteria used to evaluate the materials may be found at the end of the Manual.

*** *Teacher's Guide for Bike Basics*, 1972. 113 pages.
$3.00, notebook.

Guide Comprehensive, detailed and creative guide on bicycle safety geared to second grade level, but easily adapted to K-4. Although a 72-frame filmstrip is integrated into the activities, the *Guide* provides considerable background information about bikes and many suggested activities that may be used without the slides. Most of the classroom activities are creative and detailed, including games, puzzles, songs, physical activities and art. Activities are grouped by subject area, including art, language, math, music, science, and physical activity, enabling teachers to simultaneously teach subject area skills and bicycle safety. A 64-page student self-instructional booklet is also integrated into the guide. Major deficiency in the guide is that it is geared to presenting facts--a cognitive approach--rather than to modifying attitudes and behavior--an affective approach. Issues like peer group pressure, rebellion, risk taking, "kicks," "it-can't-happen-to-me" thinking, and other affectively-based causes for unsafe riding behavior are not treated.

Maryland State Department of Education
P.O. Box 8717
Friendship International Airport
Baltimore, Maryland 21240

** *How Do You Drive a Bike?*, 1974. Teacher's Manual and Activity Guide, 136 pages; twelve 12" x 16" posters; 6 overhead transparencies; 30 copies of thirty-six page student pamphlet; 17-minute tape and 36-frame filmstrip. $59.50.

Module Comprehensive and creative multi-media package that covers what a bike is, traffic signs, signals, traffic laws, and bicycle safety rules. Filmstrip, tape, student booklet, and poster all duplicate the same rhyming, somewhat syrupy text and illustrations and may be used to reinforce each other or independently depending on students' reading level and attention span. Unit does not indicate which activities or sections can be taught at which grade level; instead and more usefully, notations are provided instructing the teacher to discuss the pictures for children who cannot read the text. The classroom activities section is excellent, including crossword puzzles, story completions, word games, coloring pictures, and simple board games. Illustrations include ethnic minority members, but tend to be middle class. Two deficiencies of the unit are its moralizing approach (the text and illustrations tend to order students to do and not to do things) and exclusively cognitive approach (unit presents facts primarily, and does not deal with issues like peer group pressure, rebellion, risk taking, "kicks," the "it-won't-happen-to-me" philosophy, and other affectively based causes for unsafe bicycle behavior).

Kilby Associates
P.O. Box 1113
Pendleton, Oregon 97801

** *All About Bikes: A Bicycle Safety Program,* 1972. 127 pages plus 36 cut-out 3" x 5" cards; 58 visual aids that can be made into transparencies; two student workbooks (basic and advanced) and two teacher workbook editions. $42.00.

Guide Comprehensive elementary curriculum guide on bicycle use and safety. Contents include 58 visual aids which can be made into transparencies, 36 "case histories" on 3" x 5" squares, four to a page; two student (one basic, one advanced) and two teacher work booklets; and instructional objectives, vocabulary and learning experiences covering six topic areas, such as laws, use and accidents. Activity books are useful exercises in identifying objects and hazards in drawings about bicycles; visual aids are useful; case histories are too closed-ended; several of the suggested learning experiences are creative and detailed, and a few, including an "intersection" game, are exciting. Major deficiency of the curriculum is that it is geared to presenting facts--a cognitive approach--rather than to modifying attitudes and behavior--an affective approach. Issues like peer group pressure, rebellion, risk taking, "kicks," "it-won't-happen-to-me" thinking, and other affectively based causes for unsafe riding behavior are not treated.

National Safety Council
425 N. Michigan Avenue
Chicago, Illinois 60611

Traffic and Pedestrian Education Systems, 1973. 37-page Leader's Guide, 23 spirit masters, fifteen cassette tapes, fifteen filmstrips. $86.00.

Module Comprehensive multi-media unit covering all aspects of pedestrian safety for youngsters, including crossing streets, selecting safe routes to school, care with railroad tracks, and the meaning of signs. Behavior in cars and bicycle riding are also covered. Unit consists of fifteen modules. For each module the following are provided: audiotape geared to filmstrip; "immediate reinforcement activities" consisting of suggested activities such as songs and children's games; discussion topics; 1-2 activity sheets that are reproduced for students using spirit masters--activities consist of coloring exercises; and supplemental reinforcement activities such as reading poems, making wall murals, creating trains out of cartons, role plays, and children's games. Activities are creative but not always detailed. Sheet music for nine songs is provided. Tapes have music, singing, and dialogue. General approach is injunctive and cognitive, but many activities present the opportunity for more open-ended and affectively oriented classroom experiences. Filmstrip and spirit masters use ethnic minorities but are very middle class.

Elisar Research Corporation
15 East 48th Street
New York, New York 10017

Sidewalk Vehicles: Safety Education Data Sheet Number 17 (no date). 3 pages. 68¢ for 10 copies.

Pamphlet Brief discussion of aspects of tricycle safety concepts that should be taught to youngsters. Concepts and factual information are included, but not classroom activities. Useful as a brief orientation to the issues. Part of a series of data sheets on safety.

National Safety Council
425 North Michigan Ave.
Chicago, Illinois 60611

** *Teacher's Guide to Bicycle Safety Activities and Projects* (no date). 12 pages. 6¢.

Pamphlet Series of creative activities, many spelled out in detail, on bicycle safety.

American Automobile Association
Traffic Engineering and Safety Department
1712 G Street, N.W.
Washington, D.C. 20006
Stock No. 3218

* *Bicycle Safety Program Aids* (no date). 10 pamphlets and 3 posters. 11¢.

Packet Folder of materials on bicycle safety and use, including entries 11, 12, and 15 above. Included also are a pamphlet to parents on buying their children a bicycle, the results of an AAA survey on the nature and causes of bicycle accidents, a bicycle skill tests pamphlet (well illustrated and described), and a bicycle inspection check list.

The American Automobile Association
1712 G Street N.W.
Washington, D.C. 20006
Stock Number 3289

* *Terry the Tricycle* (no date). 7 pages.

Flyer Story to be read by teacher to children who ride tricycles. Account describes child's near accidents and ends with his making a list of "all the things little children should remember when riding their tricycle." Rather than read the list, teacher can ask students to supply it.

American Automobile Association
1712 G Street, N.W.
Washington, D.C. 20006
Stock No. 3208

*** *Bicycling!* Periodical. August and September 1972 and July and August 1973.

Periodical Complete bibliographies of all available books, articles and periodicals on bicycles are contained in these four issues.

Bicycling!
55 Mitchell Blvd.
San Rafael, California 94903

A Great Bicycle Book, by Jane Sarnoff and Reynold Ruffins, 1973. 31 pages. $5.95

Book Children's book on parts of a bicycle, fitting the bike to the rider, maintenance, and racing games. Illustrated in bright colors, but otherwise book does not contain anything particularly stimulating for children.

Charles Scribner's Sons
597 Fifth Avenue
New York, N.Y. 10017

List of Bicycling Books*

General

Alth, Max. *All About Bikes and Bicycling.* (Hawthorne Books: 1972).

Behrman, Daniel. *The Man Who Loved Bicycles: The Memoirs of an Autophobe.* (Harper's Magazine: 1973).

Belt, Forest H., and Bonnie C. Smith. *Belt's Easie-Guide to Multispeed Bicycling.* (Howard W. Sams & Sons, Bobb-Merrill Co., Indianapolis, Indiana 46268: 1974).

Boethling, Bob. *The Bicycle Book.* (Earth Action Council: 1971).

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Henkel, Stephen C. *Bikes.* (The Chatham Press: 1972).

Humphrey, Clifford C. *Back to the Bike.* (1972).

Kitching, Ron. *Everything Cycling.* (1971).

Leete, Harvey M., ed. *The Best of Bicycling.* (1971).

McIntyre, Bibs. *The Bike Book: Everything You Need to Know About Owning and Riding a Bike.* (Harper & Row: 1972).

Royal Society for the Prevention of Accidents. *Skillful Cycling: A Manual of Roadcraft, Cycling Technique and Maintenance for Cyclists,* New edition. (RoSPA, Purley, England: 1975).

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*Compiled by Bicycle Manufacturers Association of America, Inc., Washington, D.C.

Sloane, Eugene A. *The Complete Book of Bicycling.* (Trident Press: 1970).

Smith, Ken, ed. *The Canadian Bicycle Book.* (D.C. Heath: 1972).

Teresi, Dick. *Popular Mechanics Book of Bikes and Bicycling.* (Hearst Books: 1975).

Thiffault, Mark. *Bicycle Digest.* (Follett Publishing: 1972).

Whitt, Frank R., and David G. Wilson. *Bicycling Science: Ergomonics & Mechanics.* (MIT Press, Cambridge, MA.: 1974).

Maintenance and Repair

Ballantine, Richard. *Richard's Bike Book.* (Ballantine: 1972).

Belt, Forest H., and Richard E. Mahoney. *Bicycle Maintenance & Repair: Brakes...Chains...Derailleurs & Bicycle Maintenance & Repair: Frames, Tires, Wheels.* (Theodore Audel, Bobb-Merril Co., Indianapolis, Indiana: 1975).

Carrell, Al. *The Super Handyman's Big Bike Book.* (Prentice-Hall).

Coles, Clarence and Harold Glenn. *Glenn's Complete Bicycle Manual.* (Crown: 1973).

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Ewers, William. *Sincere's Bicycle Service Book.* (Sincere Press, Box 10422, Phoenix, Arizona, 85016).

Intertec Publishing Corporation. *How to Fix Your Bicycle.* (IPC, Technical Publications Div., Kansas City, MO.: 1973).

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Olney, Ross, R. *Simple Bicycle Repair and Maintenance.* (Doubleday & Co., Inc., Garden City, New York).

Readers Digest. *Readers Digest Guide to Bicycle Repairs.* (Hodder Causton Ltd., St. Paul's Ho, Warwick La, London, England: 1974).

Sloane, Eugene A. *The Complete Book of Bicycling.* (Trident Press, 630 Fifth Avenue, New York, N.Y. 10029).

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Whiter, Robert. *The Bicycle Manual on Maintenance and Repairs.* (Laurida Books: 1972).

XYZYX Information Corp. *Derailleur Bicycle Repair.* (Crown: 1972).

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Touring

Asa, Warren. *North American Bicycle Atlas.* (American Youth Hostel Publication: 1973).

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Hawkins, Karen and Gary. *Bicycle Touring in Europe.* (Random House: 1973).

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Kocks, Rick, and Rich Curtner. *20 Bike Rides in Franklin County (Ohio).* (1974).

Kurk, David, and Robert H. Miller. *Bicycle Trails of Southern California: The Definitive Work on Where to Bicycle in Southern California.* (Price/Stern/Sloan Publications Inc., Los Angeles, CA.: 1974).

May, Marian, ed. *Bicentennial Bike Tours.* (Gousha Publications: 1973).

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Woods, Bill, and Erin Woods. *Bicycling the Back Roads Around Puget Sound.* (Mountaineers, P.O. Box 122, Seattle, WA 98111: 1972).

History

Alderson, Frederick. *Bicycling, A History.* (Praeger: 1972).

Bangs, John Kendrick. *The Bicyclers.* (Folcroft Library Editions, Folcroft, PA 19032: 1974).

Caidin, Martin and Jay Barbree. *Bicycles in War.* (Hawthorn Books, Inc.: 1974).

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Caunter, C. F. *Handbook of the Collection, Part II, Ministry of Education: Science Museum.* (London: Her Majesty's Stationery Office: 1958).

McGonagle, Seamus. *The Bicycle in Life, Love, War and Literature.* (A. S. Barnes & Co.: 1968).

Oliver, Smith H., and Donald H. Berkebile. *Wheels and Wheeling.* (Smithsonian Institute Press, Washington, D.C. 20560: 1974).

Smith, Robert A. *A Social History of the Bicycle: Its Early Life and Times in America.* (American Heritage Press: 1972).

Wagenvoord, James. *Bikes and Riders.* (Avon Books: 1972).

Woodforde, John. *The Story of the Bicycle.* (1970).

Audiovisual Materials

Traffic and Pedestrian Education Systems, 1973. 37 page Leader's Guide. 23 spirit masters. Fifteen cassette tapes. Fifteen filmstrips. $86.00

Module

Comprehensive multi-media unit covering all aspects of pedestrian safety for youngsters, including crossing streets, selecting safe routes to school, care with railroad tracks, and the meaning of signs. Behavior in cars and bicycle riding are also covered. Unit consists of fifteen modules. For each module the following are provided: audiotape geared to filmstrip; "immediate reinforcement activities" consisting of suggested activities such as songs and children's games; discussion topics; 1-2 activity sheets that are reproduced for students using spirit masters--activities consist of coloring exercises; and supplemental reinforcement activities such as reading poems, making wall murals, creating trains out of cartons, role plays, and children's games. Activities are creative but not always detailed. Sheet music for nine songs is provided. Tapes have music, singing and dialogue. General approach is injunctive and cognitive, but many activities present the opportunity for more open-ended and affectively oriented classroom experiences. Filmstrip and spirit masters use ethnic minorities but are very middle class.

Elisar Research Corporation
15 East 48th Street
New York, New York 10017

National Directory of Safety Films, 1971. 60 pages. $3.50.

Catalogue

Capsule descriptions of safety films that can be rented from the National Safety Council; however, none are evaluated and many are included that are either poor or mediocre. The reader must take "pot luck" and preview all films ordered before using with students. Most of the films listed below are taken from this catalogue.

National Safety Council
425 N. Michigan Avenue
Chicago, Illinois 60611

The Bicycle Clown. 10 minutes, color or black and white, 66mm.

Film

Describes some of the reasons behind a youngster's reckless bike riding.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Bicycle Riding Reminders. 11 minutes, color, 16mm.

Film

A police vehicle demonstrates reaction time, braking distances, etc. when autos and bicycles are involved. Film gives basic bicycle safety points for younger children.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611
(Rental)

The Bicyclist. 15 minutes, color, 16mm.

Film

Bicycle safety education for school age children. A red bicycle tells its own story. It has had two owners--a boy who knew and obeyed the traffic rules and another who didn't.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Championship Bicycle Safety. 13 minutes, color, 16mm.

Film

Fast-paced film which relates the cycling skills of the champs to the skills needed in everyday cycling situations, with emphasis on the idea that it takes practice to ride like a pro. Includes clowns riding antique bikes in a local rodeo who demonstrate the need for watchfulness to avoid hazards.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

The Day the Bicycle Disappeared. 14 minutes, color, 16mm.

Film

When all the bicycles in town suddenly disappear, it turns out that they are protesting the hazardous riding of their owners. Not until each rider signs a safe bicycling pledge do the bikes agree to go home.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

If Bicycles Could Talk. 13 minutes, color, 16mm.

Film

Covers all aspects of bicycle safety and maintenance, as well as the role of parents in preparing youngsters for bicycle ownership.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

I'm No Fool With a Bicycle. 8 minutes, color, 16mm.

Film

History of the bicycle leads into a discussion of the rules for bicycle riding.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

7 Rules of Bicycle Safety. 6½ minutes, color, 16mm.

Film

A short positive approach film on bicycle safety for elementary age children. Only the right way to ride is shown as seven rules accepted by safety experts everywhere are illustrated.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

You and Your Bicycle. 10½ minutes, black and white, 16mm.

Film

Teaches children correct riding habits. Starts with points of safety maintenance, then shows hazards encountered on a trip to the store for mom. Shows correct arm signals, how to carry bundles, where to park, when and where to ride, results of stunting, passing improperly, hitching rides and riding double.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

A Monkey Tale--Bicycle Safety. 9 minutes, black and white, 16mm.

Film

Illustrates bicycle safety by using monkeys as actors. A monkey goes to school on his bike. He barely makes it without an accident. When he goes home he and his sister have a bad fall because he let her ride on the handlebars. Irate citizens complain and a lecture from a policeman makes him see his bad habits. Next day he practices all the safety measures and receives a reward for safety. For elementary school levels.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

One Got Fat. 17 minutes, color, 16mm.

Film

Ten bicycle-riding monkeys are going to the park for a picnic. Each has a personal characteristic that impels him to break a law regarding bicycle safety. As a result, only one arrives at the park.

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Periodicals

American Bicyclist
461 Eighth Avenue
New York, New York
10001

Bicycle Journal
3339 West Freeway
Fort Worth, Texas
76107

Bike World
Post Office Box 366
2536 Middlefield Road
Mountain View, California
94040

Bicycle Dealer Showcase
Post Office Box 2830
Newport Beach, California
92663

Bicycling
119 Paul Drive, Box 3330
San Rafael, California
94902

League of American Wheelmen Bulletin
19 S. Bothwell
Palatine, Illinois
60067

Sources of Additional Materials for Teachers

The following organizations provide various pamphlets, booklets, and posters on bicycle safety:

Allstate Insurance Company
Safety Division
Allstate Plaza
Northbrook, Illinois 60062

American Automobile Association
Traffic Engineering & Safety Dept.
8111 Gatehouse Road
Falls Church, Va. 22042

American Insurance Associacion
Publications Department
85 John Street
New York, New York 10038

Boy Scouts of America
North Brunswick, New Jersey 08902

Channing L. Bete Co., Inc.
P.O. Box 112
Greenfield, Massachusetts 01301

Employers Insurance at Wausau
Wausau, Wisconsin 54401

4-H Cooperative Extension Service
U.S. Department of Agriculture
Washington, D.C. 20250

Harleysville Mutual Insurance Co.
Loss Control Unit
355 Maple Avenue
Harleysville, Pennsylvania 19438

Highway Users Federation
1776 Massachusetts Avenue, N.W.
Washington, D.C. 20036

Imagination, Inc.
2651 University Avenue
Saint Paul, Minnesota 55114

Kemper Insurance
4750 Sheriden Road
Chicago, Illinois 60640

Liberty Mutual Insurance Co.
2955 N. Meridian Street
Indianapolis, Indiana 46207

Maryland American General Group
Inspection Department
P.O. Box 1228
Baltimore, Maryland 21203

National 4-H Foundation
7100 Connecticut Avenue
Washington, D.C. 20015

National Highway Traffic Safety
Admin.
Department of Transportation
Washington, D.C. 20590

National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Nationwide Mutual Insurance Co.
246 North High Street
Columbus, Ohio 43216

State Farm Insurance Companies
Public Relations Department
112 East Washington Street
Bloomington, Illinois 61701

The Goodyear Tire & Rubber Co.
Public Relations Department
Akron, Ohio 44316

The Bicycle Manufacturers Association of America, Inc.
1101 15th Street, N.W., Suite 304
Washington, D.C. 20005

TRANSPORTATION SAFETY

WHY TEACH ABOUT TRANSPORTATION SAFETY?

The Problems

The *overview* at the beginning of this Manual has already pointed out that travel and transportation play a tremendously important role in the lives of Americans, as all of us drive and walk almost every day and frequently ride buses, trains, planes, and boats or ride around on recreational vehicles. Most of that travel is safe, speedy, and pleasant. But when millions of people travel billions of miles, it is not surprising that accidents do happen. Greater safety can be achieved if the persons who travel--that is, all of us--become better informed about transportation services, the different modes of transportation, the special advantages of some, the special dangers of others, and the things that can be done to improve our safety while we travel.

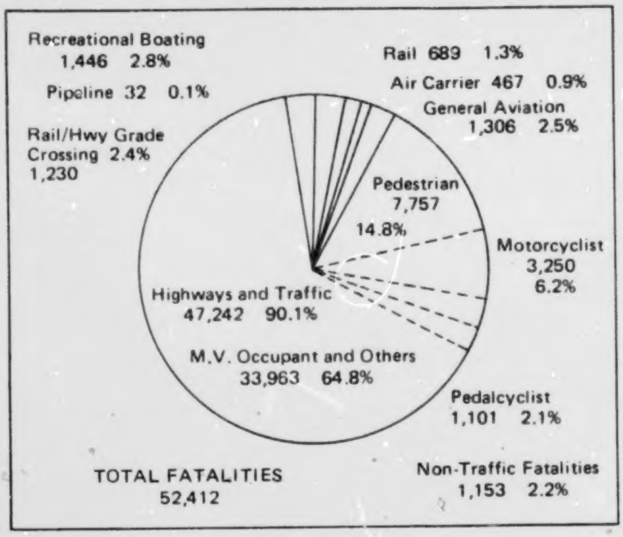
The safest way to travel is to walk. When we walk we can control where we go, when we go, how fast we go or if we go at all. Yet even pedestrians have accidents. Roughly 300,000 to 400,000 pedestrian accidents occur each year, with 8,000 to 9,000 fatalities.

Americans drive a staggering number of miles each year. The safety record of American drivers is good: there is only one traffic fatality for every *25 million miles driven*. Yet the record could be even better, and we should work to reduce the number of traffic fatalities from 50,000 each year to a lower number.

Travel for vacation and recreation should be enjoyable and safe--and most of it is. Few things are more tragic, however, than a recreational trip that is marked by an injury or even a death. Accidents do happen: in 1974 there were, for example, more than 1,400 fatalities from boating and almost 1,000 fatalities even from bicycling.

The following chart, adapted from *U.S. Transportation Information Report,* presents the total figures and relative percentages of transportation fatalities for 1974.

TRANSPORTATION FATALITIES: 1974



The Solutions

Federal, state, and local governments must promote transportation safety by providing assistance for planning, development, and financing of improved transportation vehicles and facilities. They must also enact legislation to encourage manufacturers of vehicles to develop the safest possible vehicles and to stimulate the public to engage in safe travel practices.

Local transit authorities--public transportation companies, taxi companies, ferry agencies--must provide maximum safety provisions for their customers.

Citizens and consumers must be careful. They should use different modes of transportation with full awareness of their dangers and what should be done to minimize these dangers. They should purchase vehicles that are safe to operate and maintain them in proper operating condition, persuade other people to travel safely, and participate in transportation planning to ensure that safety needs are adequately considered in the developing and servicing of vehicles and transportation facilities.

Teachers must guide students to a better understanding of the dangers involved in all kinds of travel and of ways to minimize or prevent them. Transportation consumer education can offer the student a unique opportunity to develop the awareness and skills needed to acquire responsible transportation habits and to play a role in supporting and improving transportation safety in the community.

This chapter focuses on teaching transportation safety by developing consumer skills that are particularly appropriate to grades K through 3. The learning activities are designed to make students aware of the dangers involved in all modes of travel, including walking, boating, and riding in automobiles, trains, and airplanes; to encourage students to practice safety when they are passengers riding in vehicles; to motivate students to encourage other people to engage in safe travel practices; and to develop skills in making use of emergency vehicles available in the local community.

TRANSPORTATION SAFETY

Mini-unit 3

Learning about automobile safety

Activity #	*Activity Description*	*Class Time (periods)**
10	Students discuss common driving practices which make driving dangerous and develop collages illustrating these habits.	1½-2
11	Students role play drivers and passengers in situations that involve safe (or unsafe) driving habits.	1
12	Students decorate tags with automobile safety reminders.	1-2
13	Students discuss safety belts and play a board game reinforcing their use.	1

Mini-unit 4

Learning about pedestrian safety

14	Students draw pictures and discuss them in light of the safety issues involved.	1-1½
15	Students engage in one or more mini-activities on pedestrian safety.	½-1

Mini-unit 5

Learning how to be a safe pedestrian

16	Students play games to enhance auditory perception.	½-1
17	Students learn the meaning of traffic and pedestrian signs using flashcards.	½-1
18	Students learn proper pedestrian behavior by playing games.	1½-3

Mini-unit 6

Learning how to be safe while boating

19	Students collect, look at, and handle various safety items that a boat is required to have and learn how to avoid common unsafe boating practices.	1-2
20	Students role play a family involved in a boating incident.	1

*Assumes class period of 30-40 minutes.

TRANSPORTATION SAFETY (CONTD.)

	Mini-unit 7 Learning about emergency vehicles	
Activity #	*Activity Description*	*Class Time (periods)**
21	Students discuss the nature of emergency vehicles and learn how to obtain emergency services when needed.	2-3
22	Students role play their reactions to household and community emergencies.	1
	Mini-unit 8 Learning about safe travel behavior	
23	Students listen to a story then discuss safety issues related to several modes of travel.	1
24	Students take a field trip to a rail yard, railroad crossing, or subway station to observe precautions they and others should take regarding rail safety.	2-3
25	Students play a card game and a board game which teach the difference between safe and unsafe travel behaviors.	½-1
	Supplementary Activities	
26	Students answer questions on transportation safety.	½-1

*Assumes class period of 30-40 minutes.

MINI-UNITS
AND
LEARNING ACTIVITIES

MINI-UNIT 3

LEARNING ABOUT AUTOMOBILE SAFETY

This mini-unit deals with the basic form of motorized transportation in the United States, the automobile. Specifically, it focuses on increasing student awareness of safe automobile passenger and driver behavior.

All too often safety is assumed to be the sole responsibility of the driver. In this mini-unit we point out that that is not exclusively or necessarily so. Passengers also have a responsibility when riding in an automobile to keep in mind their own safety and that of others.

The first activity looks at common driving practices which make riding in an automobile unsafe. Often these are practices people do not think are hazardous, eating while driving, combing hair, reading road maps, but which can lead to accidents. The second and third activities are directed at passenger behavior. They bring to students' attention things they may do, often unconsciously, that can disturb a driver and cause an accident. Also covered is the importance of safety belts for an automobile rider and the responsibility each of us has to wear one.

The major concepts covered in this mini-unit include

- Automobile accidents can be caused by many seemingly harmless activities.
- There are many different kinds of distractions that cause unsafe driving practices.
- There are many safety precautions people must be aware of and heed when driving or riding in a car.
- Safety belts are an important part of automobile driver and passenger safety.

MINI-UNIT 3 LESSON PLAN

Learning about automobile safety

Activity #	*Activities*	*Class Time*
10	DESCRIPTION: Students discuss common driving practices which make driving dangerous and develop collages illustrating these habits. OBJECTIVE: By the end of the activity, students will be able to name three unsafe habits of both automobile drivers and passengers.	1½-2 periods
11	DESCRIPTION: Students role play drivers and passengers in situations that involve safe (or unsafe) driving habits. OBJECTIVE: By the end of the activity, students will be able to identify those pressures on drivers and passengers that result in unsafe driving.	1 period
12	DESCRIPTION: Students decorate tags with automobile safety reminders. OBJECTIVE: After completing this activity students will be able to point out the unsafe practices in a given illustration or situation and name the safety precautions that should be taken instead.	1-2 periods
13 Spirit Masters #4, #5 #6, and #7	DESCRIPTION: Students discuss safety belts and play a board game reinforcing their use. OBJECTIVE: After completing this activity, students will be able to demonstrate knowledge of the importance of wearing safety belts by responding to a given scenario which describes someone who won't or doesn't wear safety belts.	1 period

Total Class
Time: 4½-6
periods.

ACTIVITY #10

Mini-unit Topic: Learning About Automobile Safety

Approximate Class Time: 1½-2 periods

Capsule Activity Description: Students discuss common driving practices which make driving dangerous and develop collages illustrating these habits.

Objective:

By the end of the activity students will be able to name three unsafe habits of both automobile drivers and passengers.

Concept Treated:

- Automobile accidents can be caused by many seemingly harmless activities.

Materials Needed:

Magazine or newspaper pictures, crayons, construction paper, scissors.

ACTIVITY

To start your students thinking about significant but seemingly harmless driving practices, ask them to think of any things they do or have done while riding their bicycles or walking that might lead to an accident, or have caused them to have an accident or a near accident.* Many of the things that appear in the list below, more than likely, will be mentioned by your students in relation to their own experiences.

- Daydreaming while walking or riding a bike
- Talking animatedly to a companion or another bicyclist
- Looking at the scenery

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*Mini-unit 2 in Chapter 1, "Bicycles and Bicycle Safety," deals with "Using Your Bicycle Safely." You may wish to refer to that mini-unit for bicycle safety activities for your students.

- Eating and drinking

- Riding or walking while very upset

As each practice is mentioned, discuss it in relation to driving safely and list it on the chalkboard for further reference. With this insight, students will be able to more fully appreciate the impact this type of behavior can have on automobile safety. Next, discuss any driving habits that your students recognize in their parents or other drivers as being unsafe. You may wish to show the class the illustrations included at the end of the activity as examples of unsafe driving habits. Very often, drivers do not realize that what they do in the car in addition to how they drive, may be unsafe or potentially hazardous as driving too fast. Among the things that create hazards are

- Failure to clean windshield and rear window, especially during or after a snowstorm or driving on muddy roads

- Daydreaming

- Girl and boy watching

- Reading maps

- Engaging in personal grooming (combing hair and putting on lipstick)

- Riding with boisterous or easily panicked pets

- Fiddling with radio or tape deck

- Eating and drinking

- Talking animatedly

- Chasing bugs which fly into a car

- Restraining children

- Viewing scenery

- Being distracted by passengers who are talking excessively; pointing out scenery and events; horsing around; arguing; or being affectionate

- Driving while sleepy or very upset

- Searching for things in pockets, wallets, glove compartments, back seats, or purses

At the conclusion of the discussion, the students make a collage illustrating these unsafe practices. Pictures of the items that contribute to these habits (cigarettes, food and beverages, bugs, people talking, maps, people combing hair, putting on lipstick, and barefeet) are cut from magazines or newspapers, or drawn by hand. The pictures are then pasted, collage fashion, inside an outline of a bulletin board-size automobile and displayed in an appropriate place.

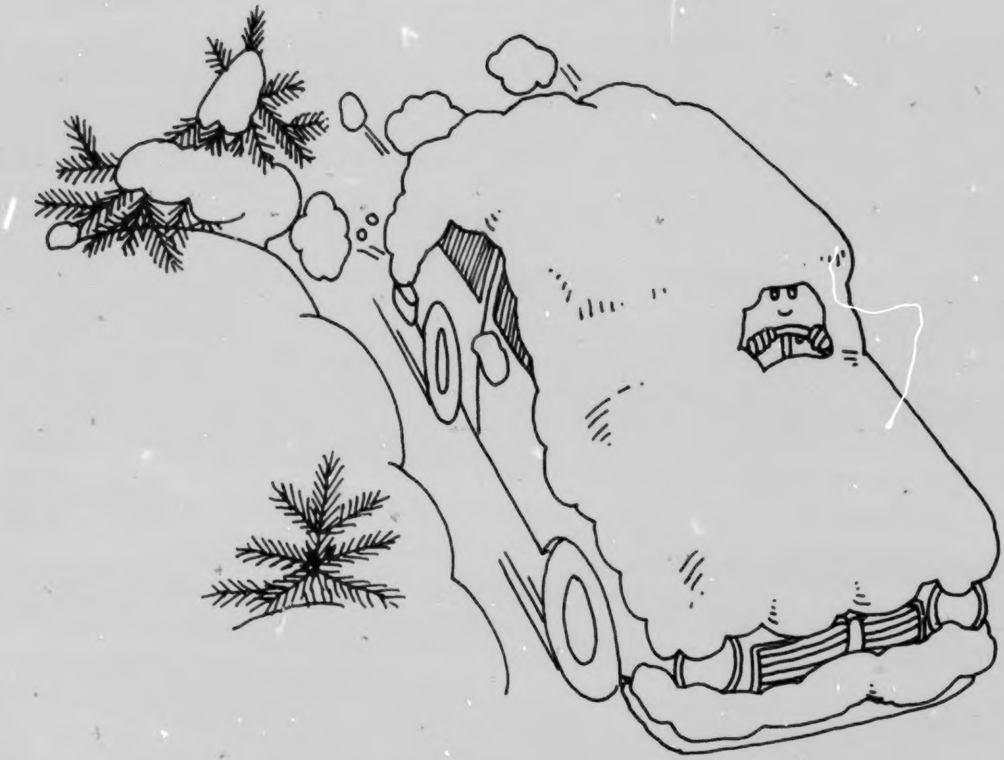
When the collage has been completed, discuss one or several of the following issues:

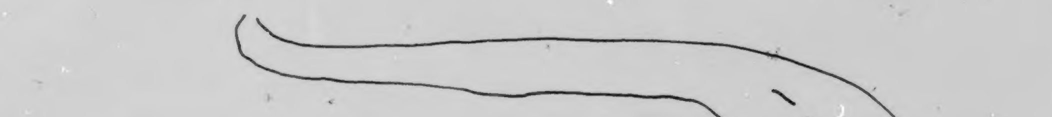
- When you realized you had done something foolish that caused or could have caused you harm, did that stop you from ever doing it again? Why or why not?
- If you were with someone who was doing something you thought might result in an accident, would you say something to ask them to correct their behavior? How would you do this without offending them?
- How would you react if someone told you you were riding your bicycle or walking foolishly and might get hurt? What would you say to that person?
- Would you ever tell your parents you thought what they were doing while driving might result in an accident? How might they react and why?

Variations and Supplementary Activities:

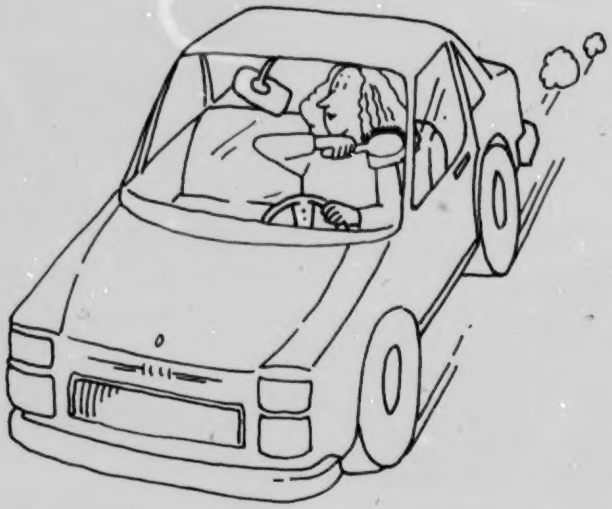
Students can observe their parents or neighbors who drive to evaluate safe and unsafe driving habits.

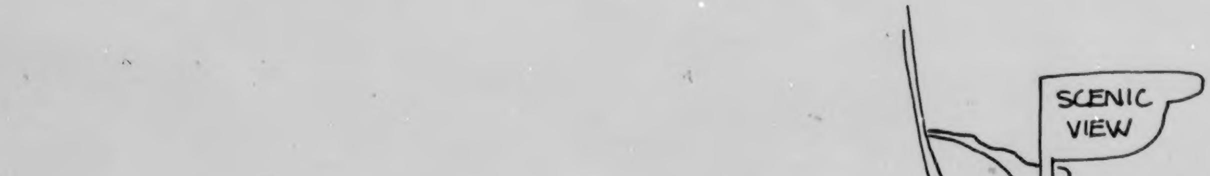
Students can compile a booklet on unsafe behavior of bicyclists, pedestrians, or automobile drivers and the resulting dangers.





What are these drivers doing that is unsafe?





SCENIC VIEW

What are these drivers doing that is unsafe?

ACTIVITY #11

Mini-unit Topic: Learning About Automobile Safety **Approximate Class Time:** 1 period

Capsule Activity Description: Students role play drivers and passengers in situations that involve safe (or unsafe) driving habits.

Objective:

By the end of the activity students will be able to identify those pressures on drivers and passengers that result in unsafe driving.

Concept Treated:

- There are many different kinds of distractions that can cause unsafe driving practices.

ACTIVITY

Place several chairs at the front of the room to set the stage for short automobile trip skits. Ask for volunteers or assign students to fill the various parts outlined in the role profiles which begin on the next page. Each skit takes place in a car en route to its destination. The students in the skit leave the room while the profiles are read to the class. The students return to the room and each reads the profiles to him or herself or you can read them aloud. After you provide a scene setting introduction, the skits are acted out spontaneously. After each skit, the participants tell how they felt about the trip and each other's behavior. The class then discusses the specific problems associated with the trip and how the trip could have been made better and safer for both driver and passengers.

After the skits have been performed, discuss the following issues:

- How do you feel when you are trying to do something and somebody is bothering you?
- How do you think a driver feels when he or she is in the car and is being bothered?
- What is the difference between being distracted at home and in a car?

- Who is responsible for making a trip safe? Why? What are your responsibilities when traveling in an automobile?

Variations and Supplementary Activities:

Students can make posters promoting safe passenger/driver behavior.

As a class, students can draw up driver and passenger safety rules.

Skit 1: Family Going to the Beach

Driver (mother or father): Traffic is just terrible. It has been bumper to bumper ever since you left home an hour ago. The beach is great but why does it take so long to get there? The kids have been jumping around the car from the minute they got in. And, the dog should have been left at home. Your wife (husband) is no help keeping the kids quiet. She (he) just stares out the window pretending everything is just fine in the back seat. Oh no, the noise is getting worse. Why is that dog whimpering? Those kids are going to get it if they don't keep the noise down. You've had it! What do you say?

Parent (mother or father): You are exhausted. It took forever this morning to get the kids ready to go to the beach. You forgot to buy ham for sandwiches. So all you've got for lunch today is peanut butter and jelly. Ick! Why doesn't anything ever go right? There better be enough towels, suntan lotion, balls, books, dog bones, shovels, pails, radios, magazines, cookies, and bottles of tonic to keep everybody happy. All you want to do is get to the beach and sleep. These trips just aren't any fun anymore. Oh no, what is going on in the back seat? If those kids get into a fight you're just goint to tell Fred (Sally) to stop the car. Then those kids can get out and walk to the beach, and that dumb dog too. You can't stand any more! You've got to say something.

Jimmy: Boy, is it ever hot in this car. Why can't Daddy and Mommy buy air conditioning when they get a car like Jessica's mother and father? Your legs stick to the seat, and bugs come in the windows. This just isn't any fun at all. That stupid sister of yours has her head out the window. She really can make you mad. She knows she's not supposed to. She always gets away with everything. She should only fall out of the car. Of course, at the rate you're moving, she wouldn't even scrape her elbow. Hey, what's that bug doing flying in your window? Oh boy, he landed right on the window ledge. Let's see if you can roll the window up and crush him. Owwwww!!!! You caught your finger in the window!!!! What do you do?

Donna: This is really neat. You love to ride with your head out the window, it is so much cooler. You get to sing as loud as you want and look in the windows of the cars going by and see what everybody is doing. The car ride has been really fun so far. Your brother is over there talking to himself and hasn't bothered you once. The dog is asleep on the floor. And, your parents haven't said one word since you left home. You wish all your car trips could be like this. Well, one more verse of "One Hundred Bottles of Beer on the Wall." After that you're going to wake up the dog to see if she wants to play for awhile. Hey, your hat just flew out the window. What do you do?

Flora (the dog): *Boy is it hot in this car!* Why does this family have to take you everywhere they go? You would rather have stayed home in your nice, cool doghouse. At least the kids haven't been poking you like they usually do. You have even been able to get a little sleep since you left home. However, it did take awhile to get used to Donna's singing and Jimmy's mumbling. Now back to sleep. Oh, oh, where did that bee come from? He's heading right for you! Owww!!!! You better do something about that bite!

Skit 2: After-school Carpool

Amy Flynn: You just hate it when it's your mother's turn to drive. She expects you to keep all the other kids quiet and on their good behavior. If anyone gets out of hand you get blamed and not they. And when the kids are having fun in the back seat you have to sit still in the front seat worrying that they may get too noisy and bother your mother. The noise never bothers you. Why should it bother her? Oh no, Joe Kramer is at it again. Why can't he leave Patty alone? You better do something quick before your mother gets upset.

Joe Kramer: Wow, you can really let go today because Mrs. Flynn is driving. She never yells at the carpool kids when she's driving but you can tell she gets really mad when you make a lot of noise. The back of her neck gets red and she keeps giving Amy dirty looks. Amy is such a goody-goody anyway that you don't care if she gets in trouble with her mother. Oh neat, Patty is sitting next to you. She is great fun to tease. Sometimes she gets so mad she cries. Let's see how long it takes before she cries today.

Patty Kimble: Where is your safety belt? Your mother always said never ride in a car without wearing your safety belt. Oh good, here it is under the seat, but it seems to be stuck. Maybe if you pull really hard it will come free. Why is Joe Kramer looking at you like that? If he starts teasing you today you are just going to scream blood murder. Okay now, one more good tug on this safety belt and you should have it. Oh no! You ripped your skirt!

Rob Hogan: Oh no, it's Mrs. Flynn's turn to drive the carpool this week. She is the worst driver you have ever seen. She's even worse than Uncle Albert. She does a million dumb things when she drives like not signaling for turns and slamming on the brakes. The last time she drove she nearly ran into a bus. She slammed on the brakes so hard you almost ended up in the front seat. It really makes you nervous to ride in her car. Maybe you should give her a hand with the driving by riding lookout. Here comes a big truck now. You better tell her it's coming, she probably doesn't see it.

Mrs. Flynn: There is nothing worse than driving a car full of noisy kids. It is so hard to drive while a bunch of kids are jumping around the car screaming and yelling. You finally gave up scolding them because you couldn't drive and tell the kids to quiet down at the same time. You even had to put Amy in charge of keeping the other kids quiet. She really hates that job but she must learn that when her friends are in your car it is her responsibility to keep them quiet. You hope the kids will be good today. You have a terrible headache and the car is making funny noises which are making you very nervous. The least outburst from the back seat is going to send you through the car roof.

ACTIVITY #12

Mini-unit Topic: Learning About Automobile Safety **Approximate Class Time:** 1-2 periods

Capsule Activity Description: Students decorate tags with automobile safety reminders.

Objective:
After completing this activity students will be able to point out the unsafe practices in a given illustration or situation and name the safety precautions that should be taken instead.

Concept Treated:
- There are many safety precautions people must be aware of and heed when driving or riding in a car.

Materials Needed:
Construction paper, crayons.

ACTIVITY

Discuss with students various automobile safety considerations that they, as passengers, and their parents, as both passengers and drivers, should be aware of and reminded of from time to time. As good safety habits are mentioned and discussed, list them on the chalkboard. Some examples follow:

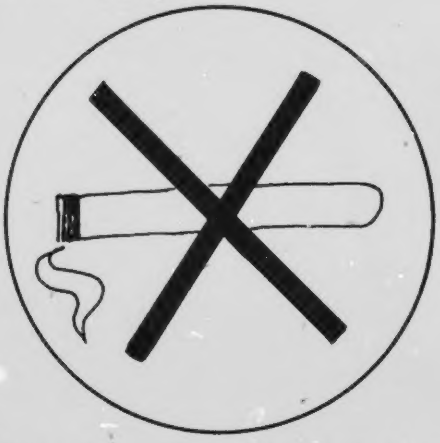
- Don't play in a parked car.
- Use safety belts.
- Keep arms and head inside the automobile.
- Don't bother the driver.
- Lock your door.
- Don't drink and drive.
- Be careful with cigarettes.

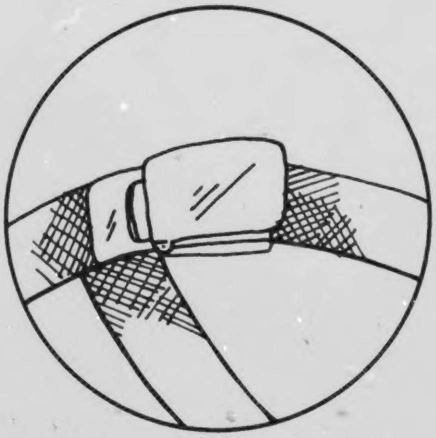
- Don't obstruct the driver's view in any way.
- Baby needs his/her own seat.
- Don't fiddle with the radio.
- Don't leave the keys in the car.
- Lock the car when not using it.

When the list is complete, ask students:

- Which safety practices do you consider to be most important and why?
- Which ones do you and your parents never or seldom heed and why? Which ones do you always heed and why?
- Do you ever think that something harmful might happen to you or the members of your family while riding in a car? Why or why not?

Ask students to pick at least one safety reminder from the list to illustrate on a small tag or disc. When completed, these tags are displayed on the bulletin board for a short time before being taken home to hang in the family car.





While the tags are still on the bulletin board, discuss with the class places the tags can be hung in the car so they will be most effective yet not interfere with the driver's vision while operating the automobile. (Hanging the tag from the rear view mirror will only create a safety hazard, therefore not achieve its purpose at all.) Before the tags are taken home, students write (or if they are not able to write yet, they can dictate to you) warnings on the backs of the tags telling where and where not to hang them.

Variations and Supplementary Activities:

Every month students can change the safety tag in the family car.

Students can poll members of their family to see if the tags have had any effect on their behavior.

Students can make safety tags to sell at the school fair or to distribute to families in their neighborhoods (remember to include the warnings on the backs of the tags.)

ACTIVITY #13

Mini-unit Topic: Learning About Automobile Safety **Approximate Class Time:** 1 period

Capsule Activity Description: Students discuss safety belts and play a board game reinforcing their use.*

Objective:

After completing this activity, students will be able to demonstrate knowledge of the importance of wearing safety belts by responding to a given scenario which describes someone who won't or doesn't wear safety belts.

Concept Treated:

- Safety belts are an important part of automobile driver and passenger safety.

Materials Needed:

Game board, game cards, and playing pieces (e.g., buttons, pebbles, erasers, or chalk).

ACTIVITY

Begin this activity by discussing with the class the following questions:

1. What is the piece of equipment in the car which you wear to help protect yourself?
2. What is the first thing you should do once you have gotten in the car and closed the door?
3. How many of you fasten your safety belt *every* time you go for a ride in the car?

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*Game developed by the U.S. Department of Transportation, National Highway Traffic Safety Administration.

4. If you don't fasten your safety belt every time, why don't you?
5. Are those good reasons for not buckling up?
6. Do your parents always use their safety belts? Why or why not?
7. What is the reason for wearing safety belts? Do you think they help?
8. Safety belts help keep you safe and alive. If your parents or a brother or sister weren't wearing their safety belts would you tell them to buckle up? Why or why not?
9. How would you tell them so they would listen?

To supplement your discussion you might consider using some of the information supplied at the end of this activity.

After the discussion, divide the class into groups of 3 or 4 students. Pass out the game boards* and safety belt cards* which can be found on Spirit Masters #4, #5, #6, and #7. Each player will need a playing piece (paperclip, pencil eraser, chalk, button, pebble) and each group will need a die. You will probably want to read aloud the instructions which appear on the game board and answer any questions students may have prior to play.

This game can also be played by students in their free time.

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*Paste both the game board and the safety belt cards onto cardboard for durability. A manila folder works well for this. Paste the game board onto the open folder. Close the folder to store the game for later play. Paste the front side of the cards onto one side of a piece of cardboard and the back side of the cards onto the other side of the cardboard. Cut along the lines.

The Facts About Safety Belts*

Almost everybody has some conception of how seat belts contribute to personal safety. Peple know that belts reduce injuries caused by striking "hostile surfaces" in the car interior. (This is the so-called "second collision." The first collision occurs when the vehicle strikes, or is struck by, another object. The "second collision" occurs when the occupant of the vehicle is flung against the instrument panel, windshield, windows and side panels, roof, doorknobs, steering wheel, and so forth. Incidentally, any one occupant can have several "second collisions" during a single accident, depending on how much he gets tossed around inside the car.) People are also aware that belts increase safety by holding the occupants inside the car, avoiding injury from "ejection."

People are generally less aware of other contributions. For example, in a collision, the occupants can fly into, or roll over, each other; by keeping them in place, belts reduce their chances of becoming another source of injury to each other. Belts can also help to prevent accidents. By keeping the driver firmly in place, they increase his control of the vehicle. By keeping the driver in a comfortable position, they can reduce fatigue and make driving a little safer. Children who are firmly buckled in are less likely to distract the driver's attention from the problems of driving. And so it goes.

However, the average person's knowledge in this area is probably superficial and somewhat vague. Maybe that is one reason why belt usage is so low--people "sort of know" that belts help, but they don't know exactly what they do or how well they do it. The short paragraphs below should help in that regard. They quote or paraphrase information that appears more extensively elsewhere. (The source document that the paragraph is based on can be found in *The Safety Belt Fact Book.*)

It *can* happen to us: *there is a high probability that the average motorist will* be involved in an accident someday soon.

> Within the next 16 seconds--and every 16 seconds thereafter--somebody will be injured in a motor vehicle accident. Every ten minutes, someone will be killed. By the end of this week, about 1,000 people will have been killed and 40,000 injured. Within a year, this will total about 2,050,000 deaths and injuries.
>
> One thousand Americans are killed every week in traffic accidents. Almost [illegible]000 are injured every day. Annually, this approximately equals the number of babies born in the United States yearly. Statistically, this means that "every American born from today forward may be killed or injured in an automobile crash."

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*Excerpted from *Automobile Safety Belt Fact Book*. U.S. Department of Transportation, National Highway Traffic Safety Administration. See first page for ordering information.

> Of the 139 drivers "at fault" (that is, responsible for the accident) at least half had been drinking. Even good drivers are at the mercy of bad drivers.
>
> Many motorists believe that it is not necessary to use belts when traveling at lower speeds. This is not true.
>
> More than half of the accidents causing injury or death occur at speeds less than 40 miles per hour. In rural areas, one-half of the fatal accidents occur at speeds under 50 mph. Almost 50 percent of all rural accidents happen at speeds under 30 mph.
>
> In one statistical analysis of 28,000 accident cases, fatalities of "non-belted" motorists occurred over the whole speed scale, starting as low as 12 mph.

Yes, they *really* do work: *some research findings about the effectiveness of safety belts.*

> If all passenger car occupants used lap belts, some 10,000 lives would be saved each year. Combination (lap/shoulder) belts would save some 20,000 lives.

In a study of 160 collisions,

> at least one occupant involved in each collision was wearing a combination (that is, lap and shoulder) belt. Ninety-six of the vehicles sustained heavy damage of the type that usually involves injury to the occupants. However, 99 percent of the occupants using combination belts had either no injury, or only minor injury.

In a study of the effectiveness of the three-point harness in 28,000 accident cases:

> Without the harness: fatal injuries throughout the whole range of accident speeds.
>
> With the harness: no deaths at speeds under 60 mph.
>
> The average injury-reducing effect of the harness was 40 percent to 90 percent.

From data on 14,261 occupants of passenger cars involved in rural crashes--2,359, or 16.5 percent, were wearing a lap belt (no shoulder restraint usage reported).

> In similar crashes, the unbelted occupants were injured substantially more frequently and more severely than the belted ones. In round figures, failure to use seat belt(s) increased injury risks as follows:

- Of immediate death or severe injury...by 100 percent

- Of more than trivial injury...by 70 percent

- Of any injury...by 40 percent

For all practical purposes, use of seat belts prevented ejection from the vehicle. This effect was estimated to account for about one-quarter of the above risk differentials. The remainder, or three-quarters of the risk differentials, are attributed to the effect of seat belt(s) in (1) preventing injury entirely, and (2) alleviating injury sustained within the vehicle.

The probability of death is almost five times greater when the motorist is thrown from the automobile ("ejected"). If ejection could be totally eliminated in automobile accidents, about 5000 to 6000 lives could be saved each year.

Seat belts are the most effective way to prevent ejection.

Even if all they did was prevent ejection, seat belts could reduce accident deaths by about 25 percent.

During an accident, people may also come into violent contact ("impact") with the car itself--doors and side panels, steering assemblies, instrument panels, and roofs. These "second and third collisions" are a major cause of death.

Lap belts permit the occupant's upper torso to "jackknife" forward and strike the car interior. However, the belts tend to reduce this impact to tolerable levels. By the time the belt-user begins to jackknife forward, the belt has already reduced the forces of impact. Shoulder belts prevent jackknifing, reducing injuries even further.

In a collision, children who are riding in the rear seat tend to become "airborne." They fly forward and are injured by impact with windshields, rear-view mirrors, instrument panels, heaters, etc. They also cause injury to the front-seat passengers by hurtling into them.

An adult in the rear seat tends to injure his face and head against the front seat. Legs are trapped under the front seat and broken. Also, an adult in the rear seat will hurtle forward, causing injury to front-seat passengers.

Safety belts can even keep accidents from happening. When seat belts keep the driver behind the wheel, everyone is safer.

> *Item*: An unbelted driver took the corner too fast. He was thrown off balance and lost control of the car. A collision resulted.
>
> *Item*: A car sideswiped a parked car. The driver (unbelted) lost control of the car, which swerved across the roadway where it collided with an oncoming car. Little if any injury resulted from the collision with the parked car, but serious injury occurred to occupants of both cars in the head-on collision.
>
> *Item*: While crossing the Golden Gate Bridge, the right-front wheel of the bus ran over a cement block which had fallen onto the roadway. The impact threw the driver out of his seat, into the stairwell. Out of control, the bus ran over the side of the bridge. There was one survivor.

In short, by keeping the driver in place, in control of the car, seat belts can prevent accidents from happening and can keep mild accidents from turning into serious ones. During an accident, children who are not belted become a hazard to everybody by becoming airborne and hurtling into other occupants. Unbelted children can also cause accidents. For example, a driver's attention was diverted when one of her children fell off the seat. She took her eyes off the road, and ran into a truck. The score:

Driver:	Minor bruises
Child 1:	Severe cut on head
Child 2:	Concussion
Child 3:	Near-fatal skull fracture
Child 4:	Severe head injuries

There are two points to observe: one, if all the children had been restrained, the accident would not have happened; two, if an accident does happen, seat belts protect the children from injury.

The point is, would you rather have a sore shoulder or a skull fracture?
Some answers to the rumors about injuries caused by safety belts:

> In the vast majority of accident cases, the seat belt presents no hazard to occupants except possibly in unusual and isolated instances. Under some extremely severe conditions, seat belts could cause serious injury; however, even so, the injured motorists would probably be even worse off without belts.

> If a car is hit from the side at the point where a motorist is sitting, he is likely to be injured whether he is or is not wearing a seat belt. However, this happens in only a small proportion of all accidents.

Based on a study of 382 accidents:

> In no case did a belt cause an injury that was more severe than the injury that would have resulted had a belt not been worn.

In an analysis of 28,000 accident cases:

> Injuries caused by the safety belt were reported in 34 cases for drivers and 25 cases for the front-seat passenger.

	Driver	*Front-Seat Passengers*
Slight single rib fracture (no hospitalization; in two cases, belt was worn too loose)	10	10
Pain in chest and bruises	6	5
Slight to moderate fracture to chest bone	3	1
Bruises and soreness in lap area	3	2
Bruises and soreness in shoulder area	1	2
Fracture of collar bone	3	2
Slight superficial wound of neck	1	1
Soreness in back	2	
Slight injury, not defined		1
Multiple rib fracture	5	1

Most injuries reported to be caused by belts occurred in accidents in which occupants not wearing belts were seriously injured and in accidents at high speeds.

Therefore, the injuries caused by the seat belts were very slight in comparison with the injuries sustained by motorists not wearing belts in the same accidents.

Myths and Facts About Safety Belt Use

The Myth: If I'm just going shopping, why bother? I don't need a belt driving around town at low speeds.

The Fact: Injury-causing accidents occur at all speeds. Furthermore, the accident rate is lower on turnpikes and freeways than on city streets.

The Myth: What if the safety belt traps me in a burning or submerged automobile?

The Fact: Without a belt, the motorist may be dazed or stunned by the crash; this would increase the time it takes to get out of the car. With a belt, the motorist is more likely to be unhurt, alert, and capable of getting out quickly. Therefore, the belt will speed up, rather than slow down, the escape process.

The Myth: Many motorists have been "saved" by being thrown out of the car.

The Fact: There is virtually no situation in which people are not better off inside the car.

The forces in an accident are so great that a person ejected from an automobile can be flung 40 to 50 feet or more from the car. (One body was found 150 feet from the car from which it had ejected.) Whether this distance is covered through the air, scraping along the ground, or both, it is highly likely to have serious results. In other cases, the car door is sprung, the motorist falls out, and the car rolls over and crushes him. Despite any emotional fantasies about "being thrown clear," sheer common sense--based on extensive statistics--says it's better to stay inside the car.

> A station wagon carrying a family of six was struck from the rear. It ran off the road and rolled over. The mother flew out the door and was killed when her head hit a rock. Three of the children stayed in the car; all had broken bones, but lived. The father stayed in the car and was not injured. When the police arrived, the father was frantically searching for the eighteen-month-old boy his wife had been holding on her lap. Half an hour later, they found the baby. Otherwise unharmed, he had drowned because he was hurled into six inches of water.

The probability of death is almost five times greater when the motorist is thrown from the automobile.

Safety Belt Use

Belt usage varies from trip to trip. The same person may wear a belt on one kind of trip, not wear it on another. For "short" trips--under 25 miles each way--the drivers report belt usage as follows:

Always use: 17 percent of the drivers

Sometimes use: 32 percent of the drivers

Never use: 51 percent of the drivers

For "longer" trips--26 to 150 miles each way:

Always use: 39 percent

Sometimes use: 26 percent

Never use: 35 percent

For cross-country trips--over 150 miles each way:

Always use: 44 percent

Sometimes use: 28 percent

Never use: 28 percent

Ninety-five percent of all the trips made by these drivers were "short" trips: Of every 20 trips, 19 were "short":

Only 66 percent of the drivers go on "longer" trips.

Only 33 percent make "cross-country" trips.

The drivers who use lap belts most often also tend to use shoulder belts most often. Similarly, drivers who use lap belts least tend to use shoulder belts least.

MINI-UNIT 4

LEARNING ABOUT PEDESTRIAN SAFETY

Most people don't think of walking as a mode of transportation; it's just something we do. However, when we walk in places where we compete with other modes of transportation, it becomes clear that safety considerations apply. This mini-unit introduces students to the hazards people face as pedestrians and ways in which to cope with them.

In the first activity, students look at a seemingly harmless everyday situation, and locate and discuss what safety hazards exist there for pedestrians. The second activity in the unit is a collection of short mini-activities. These activities range from finding and pointing out safety hazards in a student's own neighborhood or community to making pedestrian "bumper stickers" that can be worn at night to reflect light.

The concepts treated in this mini-unit include:

- Almost every outdoor situation we find ourselves in requires us to think of our safety as pedestrians.
- There are many things in our environment which we must be aware of in order to be safe pedestrians.
- There are many things such as signs, signals, and walkways which help pedestrians to walk safely.
- There are many things pedestrians can do to avoid being injured.

MINI-UNIT 4 LESSON PLAN

Learning about pedestrian safety

Activity #	Activities	Class Time
14	DESCRIPTION: Students draw pictures and discuss these in light of the safety issues involved. OBJECTIVE: After completing this activity, students will be able to demonstrate knowledge of some potential pedestrian hazards. Given an illustration, students will be able to point out and name three things in the picture that could be hazardous for a pedestrian.	1-1½ periods
15	DESCRIPTION: Students engage in one or more mini-activities on pedestrian safety. OBJECTIVE: After completing one or more of these mini-activities, students will be able to identify and name at least one thing they can do or should be aware of to be better and safer pedestrians.	½-1 period per mini-activity

Total Class Time: 1½-2½ periods.

ACTIVITY #14

Mini-unit Topic: Learning About Pedestrian Safety

Approximate Class Time: 1-1½ periods

Capsule Activity Description: Students draw pictures and discuss them in light of the safety issues involved.

Objective:

After completing this activity, students will be able to demonstrate knowledge of some potential pedestrian hazards. Given an illustration, students will be able to point out and name three things in the picture that could be hazardous for a pedestrian.

Concepts Treated:

- Almost every outdoor situation we find ourselves in requires us to think of our safety as pedestrians.
- There are many things in our environment that we must be aware of in order to be safe pedestrians.

Materials Needed:

Drawing paper, crayons.

ACTIVITY

List on a chalkboard the following items: a dog, a car, rain, railroad tracks, a boy crying, and a road. On large pieces of drawing paper, students illustrate a story or event using all the items listed above. Students need not be limited to only those items on the list, but they should be the major focus of the drawing.

When the drawings are complete, students make up captions for their illustrations.

Several students show their drawings to the class and explain the story or event they have illustrated. After the pictures have been described, hang them in front of the room. Discuss with the class each picture in light of the safety issues involved.

- Did anyone think of the boy as a pedestrian? Why or why not?

- Are there things in the picture that he must be careful of? (railroad tracks, car)

- Will the boy be a better or worse pedestrian because he is crying? Why?

- It is raining in the pictures. Does that affect the boy's safety in any way?

- If there are no sidewalks in the picture, does that make it more or less safe for the boy? Why?

- And what about the dog? Might the dog create a safety problem for the boy or for the driver of the car?

- Do you see any other problems in these pictures that you were not aware of before?

- Do you ever think of yourself as a pedestrian? Why or why not?

- Is there anything you should remember when you are outdoors? (pay attention, be alert, be careful)

Other students in the class may then want to show their pictures, tell their stories, and describe any safety problems illustrated in them.

Variation or Supplementary Activity:

Students can look through books and magazines for pictures of people involved in seemingly harmless situations but which, in fact, portray potential safety hazards.

ACTIVITY #15

Mini-unit Topic: Learning About Pedestrian Safety

Approximate Class Time: ½-1 period per mini-activity

Capsule Activity Description: Students engage in one or more mini-activities on pedestrian safety.

Objective:

After completing one or more of these mini-activities, students will be able to identify and name at least one thing they can do or should be aware of to be better and safer pedestrians.

Concepts Treated:

- There are many things that hinder pedestrian safety.
- There are many things such as signs, signals, and walkways that help pedestrians to be safe.
- There are many things people can do to make walking a safe activity.

Materials Needed:

See individual mini-activities for materials needed.

ACTIVITY

Students engage in one or more of the mini-activities on the following pages.

Walking to school

Using any media they desire, students make a map of their neighborhood indicating streets, sidewalks, traffic lights, stop signs, houses, and stores. Students then decide the best way to walk to school and draw their routes on the maps. All students, whether they actually walk to school or not, can participate in this activity. They need only pretend that if it were possible for them to walk to school, this is the route they would take. Students who live in the same neighborhood compare their routes and discuss what safety hazards are (or would be) encountered and what safety precautions must be taken while walking to school. You may want to check out the most appropriate routes for your students prior to this activity.

Pedestrian aids

Working as a class or in small groups, students decorate their room with pedestrian signs and signals: traffic signals; walk/don't walk signals; signs--pedestrian crossing, school crossing; street crosswalk markings, etc. These signs and signals should be near-to-lifesize and closely resemble the actual aid. For example, students can make a crosswalk on their classroom floor using masking tape. A traffic light can be made from cardboard (see attached instructions).

Discuss how each of these aids helps and protects the pedestrian.

Note: these signs and markings can be used while playing the games found in Mini-unit 5, Activity #18.

*Pedestrian colors at night**

Cut out equal size cloth letters or numbers of different colors such as white, bright orange, blue denim, and non-reflective black. Tape four of each of the different colors at random on a dark wall or blackboard in a darkened room. Give a student a flashlight and instruct him or her to enter the room, shine the light on the wall, and identify the first five letters or numbers seen. Do this several times, and discuss the application of these experimental results to pedestrian clothing color while walking along a road at night.

Pedestrian jacket stickers

Cut light-colored (preferably white) fabric into rectangular (5" x 10") shapes to use as a backing for the bumper stickers--one per student. Using reflective tape or paint, students write a brief message on the fabric:

---

*This mini-activity was developed for this activity by Donald Bockler, Belmont, Massachusetts, a science teacher.

SLOW DOWN

YOU'RE BIGGER--GO SLOWER

I'M A PEDESTRIAN

BE KIND TO PEDESTRIANS

The finished stickers can be sewn onto the backs of students' jackets, both to promote safety during the day and to aid students in being spotted by motorists when walking at night.

Model of a traffic signal light

Materials Needed: Two boxes; one long mailing tube or broom handle; red, green, yellow, and black construction paper; stapler; and glue.

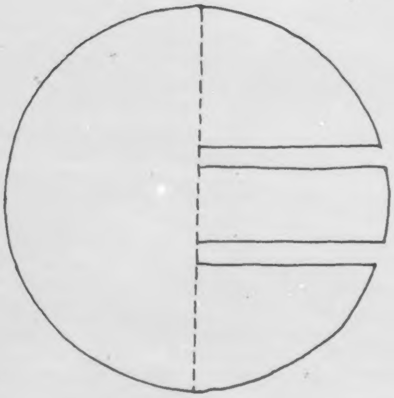
This miniature stop light is 54" high, just the right size for small students. It is composed of three main elements: the base, the pole, and the light. A box, 12" x 9", can be used for the base and a hole cut in the center of it, the diameter of which is slightly smaller than that of the pole. (This is so that the pole will be held firmly, without slipping.) A mailing tube 34" long can be used to make the pole, although a broom handle would work just as well. The light on top is made from a box 7" square and 18" tall. Since a box of this size may be hard to find, you may have to make one yourself.

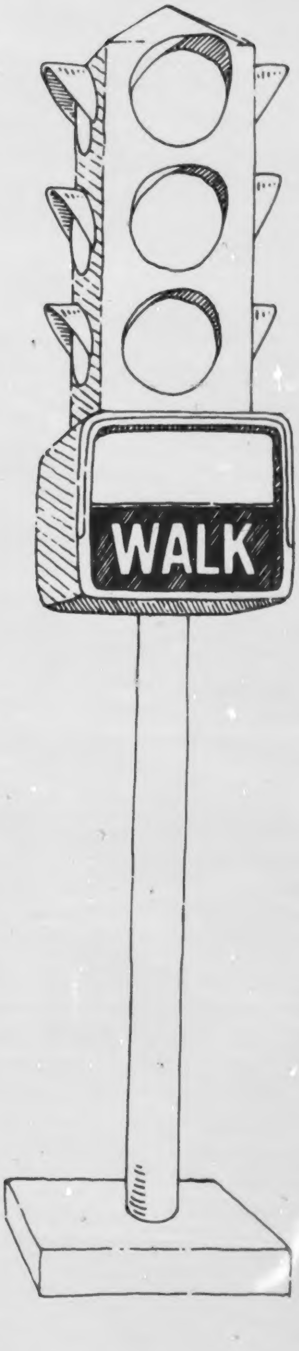
Once you have the shapes made for the base, pole, and the light, cover them with yellow paper. To form the pointed top of the light, cut the paper for the sides of this box about 6" longer than necessary. Then glue the paper to the box, letting the extra 6" stand free. Fold a V-shape in each of the corners, pull the middle sections together at the top, and staple. Cut a hole in the bottom of the box to insert the pole.

Now cut out a piece of cardboard 10" x 8". Cover it, using black construction paper. On the top half, print the words "DON'T WALK" using white paint; on the bottom half, print the word "WALK." Attach the pedestrian signal beneath the traffic signal as illustrated on page 164.

The next step is to cut out the circles for the three lights out of red, yellow, and green construction paper. Cut four of each color. Print STOP on the red, GO on the green.

If you want to make the shades that fit above the lights, here's how to do it: Draw a circle out of black paper about ½" larger in diameter than the colored lights. Then fold it in half. Unfold, and cut it so it looks like the circle drawing below. Next, pull all three tabs toward the center, just enough to make the shield fit over the colored light. Then staple or glue the appropriate colored light over it.




WALK

MINI-UNIT 5

LEARNING HOW TO BE A SAFE PEDESTRIAN

It is important to learn what are safe and unsafe ways of walking, particularly in situations where pedestrians may be endangered by automobiles. In order to learn to be a safe pedestrian, three skill areas need to be developed: auditory skills, reading and recognition skills, and motor skills.

The three activities in this mini-unit are devoted to developing these skills. The first activity enhances auditory perception; the second deals with traffic sign recognition and comprehension; and the third reinforces proper behavior while walking and playing.

Specific concepts this mini-unit covers include:

- Being able to recognize and differentiate among street sounds helps make a person a safer pedestrian.
- Pedestrians and motorists have rights, and each must be aware of his or her own and those of other travelers.
- There are several behaviors that must be learned, followed, and adhered to in order to be a safe pedestrian.

MINI-UNIT 5 LESSON PLAN

Learning how to be a safe pedestrian

Activity #	*Activities*	*Class Time*
16	DESCRIPTION: Students play games to enhance auditory perception. OBJECTIVE: After completing two or more of these mini-activities, students will be able to demonstrate auditory discrimination skills helpful to pedestrian safety. Given a group of common street sounds, students identify by name as many as they can.	½-1 period/ game
17	DESCRIPTION: Students learn the meaning of traffic and pedestrian signs using flashcards. OBJECTIVE: After completing this activity, students will be able to demonstrate knowledge of pedestrian and traffic signs by explaining the meaning of at least three signs common to their neighborhood or community.	½-1 period
18	DESCRIPTION: Students learn proper pedestrian behavior by playing games. OBJECTIVE: After playing two of these games students will be able to demonstrate correct pedestrian behavior by playing the third game without making any errors.	½-1 period/ game

Total Class
Time: 1½-3
periods.

ACTIVITY #16

Mini-unit Topic: Learning How to be a Safe Pedestrian

Approximate Class Time: ½-1 period/game

Capsule Activity Description: Students play games* to enhance auditory perception.

Objective:

After completing two or more of these mini-activities, students will be able to demonstrate auditory discrimination skills helpful to pedestrian safety. Given a group of common street sounds, students identify by name as many as they can.

Concept Treated:

- Being able to recognize and differentiate among street sounds helps make a person a better and safer pedestrian.

Materials Needed:

See individual mini-activities for materials needed.

ACTIVITY

On the following pages are several mini-activities designed to increase students' auditory perception and thus make them better and more alert pedestrians. By engaging in these activities, students will be better able to differentiate between significant traffic noises and insignificant background noises in traffic environments.

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*Excerpted from Maryland State Department of Education, Safety Education and Transportation, *Safety Instructional System: Traffic Safety* (Baltimore, Maryland).

Sounds Heard in the Classroom

What kinds of sounds can be made with various objects in our classroom?

A pencil, ruler, or small stick is used to tap various objects around the room. The following may be suggested by the students: windowpane, window frame, radiator, dish, window box, doll house, aquarium blocks, cardboard, chalkboard frame, easel, faucet, sink glass, jar, milk container, flower pot, chair, chalk box, desk, floor, bulletin boards, and wall. Ask the children to describe the sounds (squeak, clink, hiss, etc.).

What sounds are heard in the classroom?

This is a game in which the students close their eyes and listen to all the sounds they can hear while sitting quietly in the classroom. After a minute or two, have them name the sounds they heard, such as: rattling of a window, ringing of a bell, rumbling of a truck, tapping of feet, creaking of floors, hissing of a radiator, flapping of shades, whistle of trains or boats, breathing of a nearby child, screeching of brakes, shouting of voices, singing of birds, honking of auto horns, and the clanging of garbage cans. There are many different sounds. You can often tell, without looking, what made a sound.

Tapping game

Students listen while you tap loudly on the chalkboard, then faintly on the desk, then very loudly on the chair. A student is called on to repeat the tapping. A variation is for the children to count a series of taps and tell you how many they have heard at a given time. Another variation is to have students sit in a circle. One student stands behind another in the circle and bounces a ball (set a limit as to the number of times the ball can be bounced.) The student who is seated counts the number of bounces. If correct, he or she bounces the ball next.

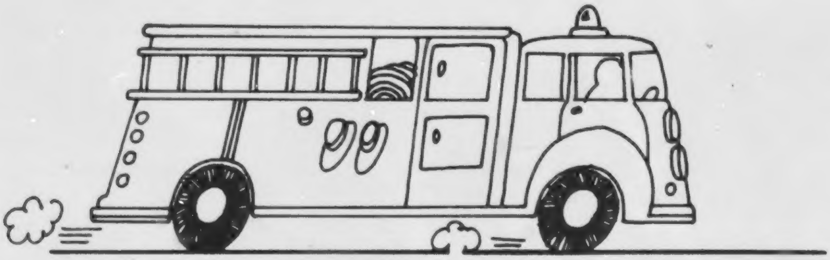
What do you hear?

Choose a period of the day when students can hear sounds in the street, the halls, or the classroom. Say, "Let's all sit as quietly as we can. Now, what different sounds can you hear?" (Clock ticking, car going by, steps in hall, whistle, dog barking, car horns.) Another time you might say, "I hear a sound in the hall. What is it?" "I hear a truck horn. Can you make that sound?" Encourage students in particularly good auditory perceptions, such as awareness of differences in tempo, pitch, strength, or quality of sounds (fast or slow steps; different kinds of airplanes, cars, and bells). Students who have difficulty in auditory perception should be encouraged to report on any unusual sounds they hear at home or at school. They may be asked to decide whether sounds are the same or different. The Audubon Bird Whistle may be used for effective bird calls. "Same" or "different" may be asked.

Sounds Heard in the Neighborhood

What sounds are heard in the neighborhood?

Take a walk around the block to listen to neighborhood sounds. Ask the students to name the source of each sound, and to imitate it. Some of the sources may be barking dogs, meowing cats, talking people, ringing church bells, honking automobile horns, screeching auto brakes, the digging of a power shovel, clicking of traffic lights, tinkling of an ice cream wagon bell, the clattering of an air drill, and the wailing of fire engine sirens.



Near or far?

Identify outdoor sounds with closed eyes and tell if they are near or far.

Near or far?

Students may be encouraged to discriminate between sounds that are near and those that are far away. If a siren or a moving vehicle is heard in the distance, call attention to the way the sound changes when it comes near and then fades away. The same question may be asked about trucks or someone running.

Who has the bell?

One student is selected to be the "listener." He or she stands in the front of the room with his or her back to the class. The leader moves quietly around the room with the bell, which is then placed in the lap of some child. The leader then goes to the front of the room and says, "Ring the bell, who has the bell?" The student who has the bell then rings it. The listener becomes the next leader and the bell-ringer becomes the next listener. If he or she does not succeed in naming the bell-ringer in three guesses, another listener is chosen.

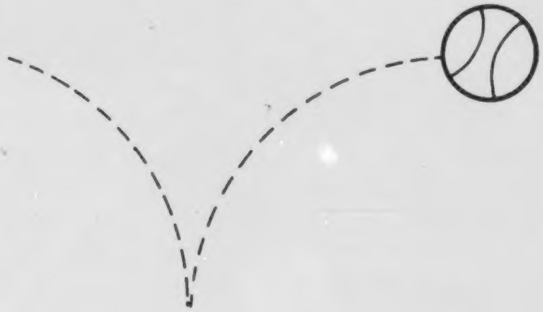
Sounds Heard in School

What sounds are heard in school?

Take the class on a sound hunt. Ask students to identify the sound they hear. Confirmation may be made by locating the origins of the sound if practical. List the sounds for follow up activities in the classroom. Some of the sounds that may be heard are the following:

On stairs and in hallways, one can hear the voices of students and teachers from classrooms, footsteps of people walking up or down stairs, repairmen putting in new windows, ringing of phone or office bells, and the clinking of china and silverware in the lunchroom.

Near the gymnasium, one can hear bouncing of balls, scuffing of feet, and shouts of students.



Near the auditorium, one can hear sounds from television, phonograph, and tape recorder; musical instruments; and voices of performers on stage.

On returning to the classroom, discuss the sounds with the students.

ACTIVITY #17

Mini-unit Topic: Learning How to be a Safe Pedestrian

Approximate Class Time: ½-1 period

Capsule Activity Description: Students learn the meaning of traffic and pedestrian signs using flashcards.[1]

Objective:

After completing this activity, students will be able to demonstrate knowledge of pedestrian and traffic signs by explaining the meaning of at least three signs common to their neighborhood or community.

Concepts Treated:

- Traffic signs are helpful to both drivers and pedestrians.
- Pedestrians and motorists have rights, and each must be aware of his or her own and those of other travelers.

Materials Needed:

Flashcards (provided [illegible] Activity #5).

ACTIVITY

Show the class flashcards of various traffic signs, such as the ones given in this activity, and explain the meaning of each one as you do so.[2] When the class has a working knowledge of the signs, divide the students into teams to play a game similar to a spelling bee. With the teams on either side of the room, hold up a flash card for a member of one team to explain. If it is explained incorrectly, that student sits down and the next student on the team tries to answer it. The team which has the most students still standing at the end of the game is the winner.

---

[1] This activity has been adapted from *A Teacher's Guide to Bicycle Safety Activities and Projects* by the American Automobile Association (AAA).

[2] Additional sign flashcards may be taken from Activity #5, Chapter 1, and used here if desired.

The students can design their own signs for their classroom or community which they think might be more helpful to pedestrians than the ones previously shown. When the signs are completed, the students tell where they would locate their signs and why they are needed there.

Variations and Supplementary Activities:

Students can crayon black and white signs with appropriate color. Students can match sign instructions with appropriate sign shape or vice versa (e.g., STOP/hexagonal; YIELD/triangular; RAILROAD CROSSING/round). Students can choose or pick at random two or more signs from the "sign flashcard box." They can then write or tell stories based on those signs.

ACTIVITY #18

Mini-unit Topic: Learning How To Be a Safe Pedestrian

Approximate Class Time: ½-1 period/game; 1½-3 periods for entire series

Capsule Activity Description: Students learn proper pedestrian behavior by playing games.*

Objective:
After playing two of these games students will be able to demonstrate correct pedestrian behavior by playing the third game without making any errors.

Concept Treated:
- There are several behaviors that must be learned and adhered to in order to be a safe pedestrian.

Materials Needed:
See individual games for materials needed.

ACTIVITY

Students play two or more of the games which appear on the following pages.

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*These games have been adapted from *Threat Detection Training Programs for Child Pedestrian Safety Volume 1: Conduct, Results, and Recommendations*, Richard L. Kueker. Prepared for National Highway Traffic Safety Administration, Department of Transportation, Washington, D.C., March 1975. The games are in the process of being further developed and tested.

Game 1

Put about 10 feet of masking tape in a straight line parallel to and about three feet away from the doorway of your room. Put another 10 feet of masking tape in a parallel line about seven feet from the first line. The taped lines serve as curbs; the area in between is the street. If your classroom is small, arrange for the use of a large room such as the gym or auditorium.

With your back to the children, model the correct behavior sequence, using the tape to serve as curb and street. Explain that since no cars are in view you can cross the street. Cross again, facing the children, and repeat the sequence. Mention that the reason you look to the left a second time is because the cars approach from that side. Emphasize that when you perform the sequence, you are looking for cars.

Guide each child through the behavior sequence. As the child is performing, instruct him/her to say left-right-left. Do not let the child sit down until he/she is able to perform the sequence correctly.

Have the children choose partners. Instruct each pair to perform the sequence, saying left-right-left. Make sure each pair performs the sequence correctly before sitting down.

If your class is large you may find it more appropriate to perform the exercise *only* in pairs or by having half the class demonstrate the correct behavior sequence while the rest of the class watches.

Game 2: Shuttle Game

Please see the diagram of the playing area on page 177. Note that you will need the help of an aide.

Teams are required to touch colored bases on a cue from you and return to the starting circle as quickly as possible. There are three bases. In order to touch certain bases, the team members must cross a "street," and exhibit the proper behavior sequence before crossing. Those who fail to look left-right-left are sent back to begin again, thus taking up time and delaying the entire team's progress. One car mock-up will serve as a parked car. The other two will be "driven" up and down the street. The children must step to the streetside edge of the parked car before performing the behavior sequence.

Materials Required

2" masking tape

3 mock-up cars*

80 white game pieces

40 blue game pieces

40 yellow game pieces

1 yellow plastic wastebasket

1 blue plastic wastebasket

1 white plastic wastebasket

2 sets colored (yellow, blue, and white) marbles

Arrange for use of large room, gym, or auditorium if your classroom is too small.

Place about 30 feet of tape in a straight line near the center of the room, as in Figure 1. This is to serve as a curb. Place another 30 feet of tape about 10 feet away from the first line, parallel to it. This is the other curb. The area in the middle will serve as a street. Connect the curbs with two parallel strips of tape about five feet apart. This will serve as the cross-walk.

Place wastebaskets, which serve as bases, as shown on the diagram. The white base should be directly in the center across the street. The yellow and blue bases should be about 30 feet apart on the same side as the children.

Place the colored game pieces in the wastebaskets of the same color.

Put one of the car mock-ups parallel to the curb in the street area. It is to serve as a parked car.

Divide the class evenly into two teams.

Assign two children, one from each team, to act as cars. Have them walk at a slow, even pace in the street area. (Have them circle the room, in opposite directions, so the cars aren't always in the street.)

Have one team line up as shown in the diagram.

---

*Large signs with the word car written on them can be used or students can draw the side of a car on large pieces of poster board.

You and your aide should stand near the white base. You will watch one team and the aide the other. Each of you should have a set of colored marbles.

To begin the game you and your aide at the same time take a marble at random from the container and call its color to the first person in line on your respective teams. For example, David, yellow. Replace the marble in the container and shake.

When called, the player runs to the proper base (yellow in the example), takes a yellow game piece, and returns to the end of the line.

As soon as the player on your team returns to the line, pick another marble and call its color to the next child on your team. Your aide, of course, will do likewise.

When you select a white marble, call to the child to come over to where you are standing. The child must cross the street at the crosswalk. Before crossing, he/she must perform the behavior sequence. If he/she tries to cross without performing the behavior sequence, he/she must go back to the curb and start over. If the sequence is performed correctly, give him/her a red safety token. The child also takes a white game piece from the basket and returns to his/her team. Watch the child as he/she recrosses the street to assure that the recrossing is also correct.

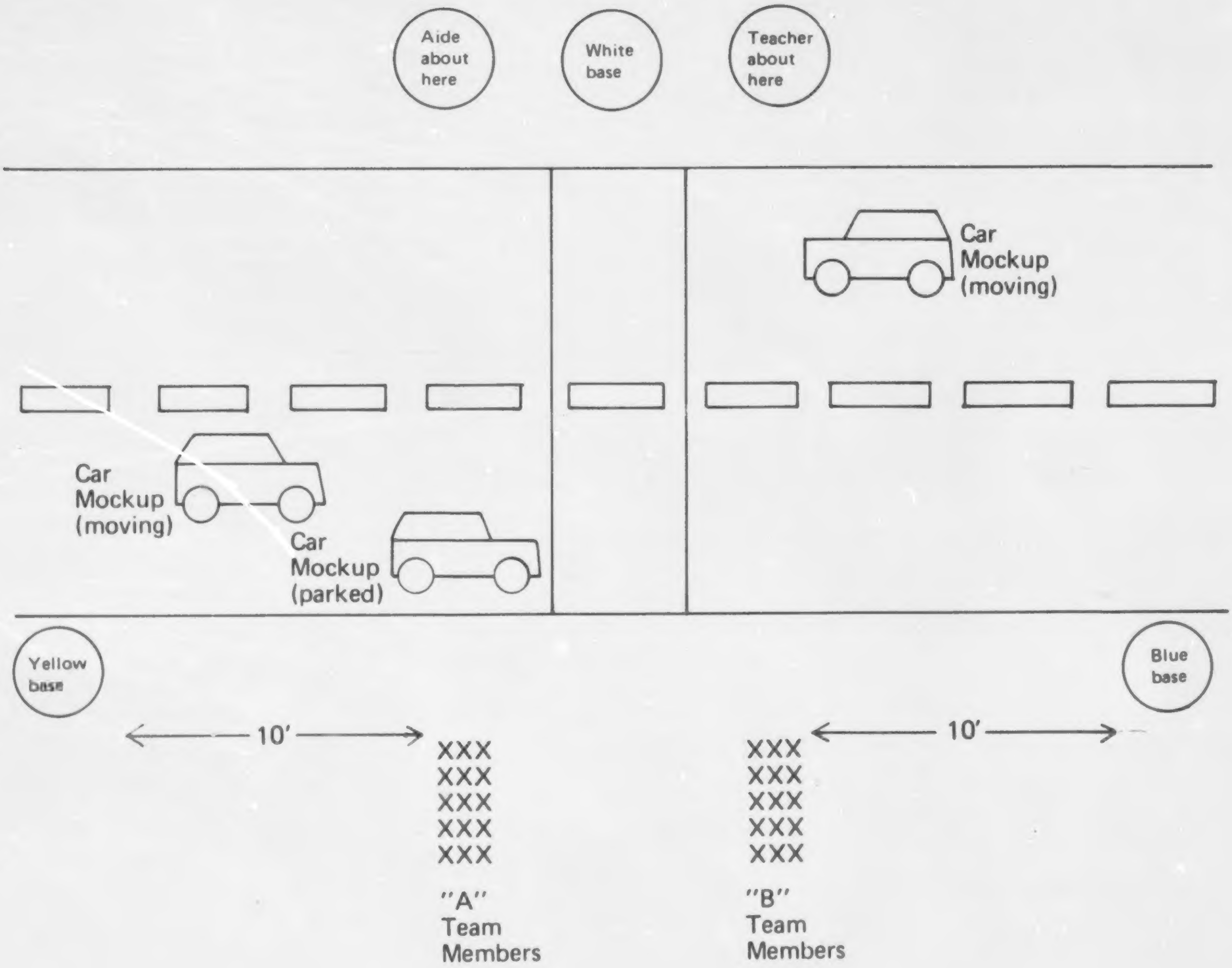
Halfway through the game, assign two different children to act as cars, so everyone gets to play.

Play the game for a specified time (for example, 20 minutes). Collect and count the game pieces. The team with the most pieces is the winner.

Variation or Supplementary Activity:

You can play Game 2 outdoors under realistic conditions. Make sure that all arrangements have been made for blocking traffic on the street during the period in which you will be conducting the session. Played this way, the game does not require car mock-ups, masking tape, or the safety tokens.

Figure 1 Playing Area for "Shuttle" Game


Aide about here
White base
Teacher about here
Car Mockup (moving)
Car Mockup (moving)
Car Mockup (parked)
Yellow base
Blue base
10'
10'
XXX
XXX
XXX
XXX
XXX
"A" Team Members
XXX
XXX
XXX
XXX
XXX
"B" Team Members

Game 3: Follow the Leader Game

Please note diagram in Figure 2 on page 180.

Introduction

In this session, the children will play a game in which they must follow a path which crosses the street. They must perform the correct behavior sequence to cross. If a child fails to perform the sequence, he/she must exchange places with the child behind. This game provides the children with opportunities to practice the behavior sequence when they are in the situation of being pursued.

Materials Required

2" masking tape (plain)

3" tape, red and blue

6 chairs

3 large wastebaskets

60 red safety tokens

In the classroom or gym area, put 50 feet of masking tape in a straight line. Put another 50 feet of tape in a parallel line about eight feet from the first line. Mark out two crosswalks with masking tape as are shown in the diagram.

Arrange the 6 chairs and the wastebasket as depicted in Figure 2.

Make a 3 feet x 6 feet start zone and end zone with the masking tape as shown in the figure.

Mark the path outlined in the figure with small pieces of colored tape to direct the children through the course. For older children (second and third grade) two colors of tape can be used (red for hopping, blue for running).

Assign two children to be "cars." Instruct them to walk at a slow, even pace in the street. (Have them circle part of the room in opposite directions so the street will be clear at times.)

Ask the class to line up in a row in the start zone, beginning with the smallest child.

Explain that the object of the game is to complete the course and reach the end zone as quickly as possible without making any mistakes in following the path and without letting anyone catch up and pass them. Children can only be passed in the game area, NOT in the street. A child who is waiting to cross the street can't be passed by another child.

The first child in line (the smallest in the class) is told to begin walking the path as quickly as he/she can, but to make sure the path is followed. (In the older children's version, explain that wherever there is red tape the child must hop on one foot; where there is blue tape he/she must run.) The next person begins when the first child crosses the street for the first time and each successive player begins when the child before him/her reaches that point.

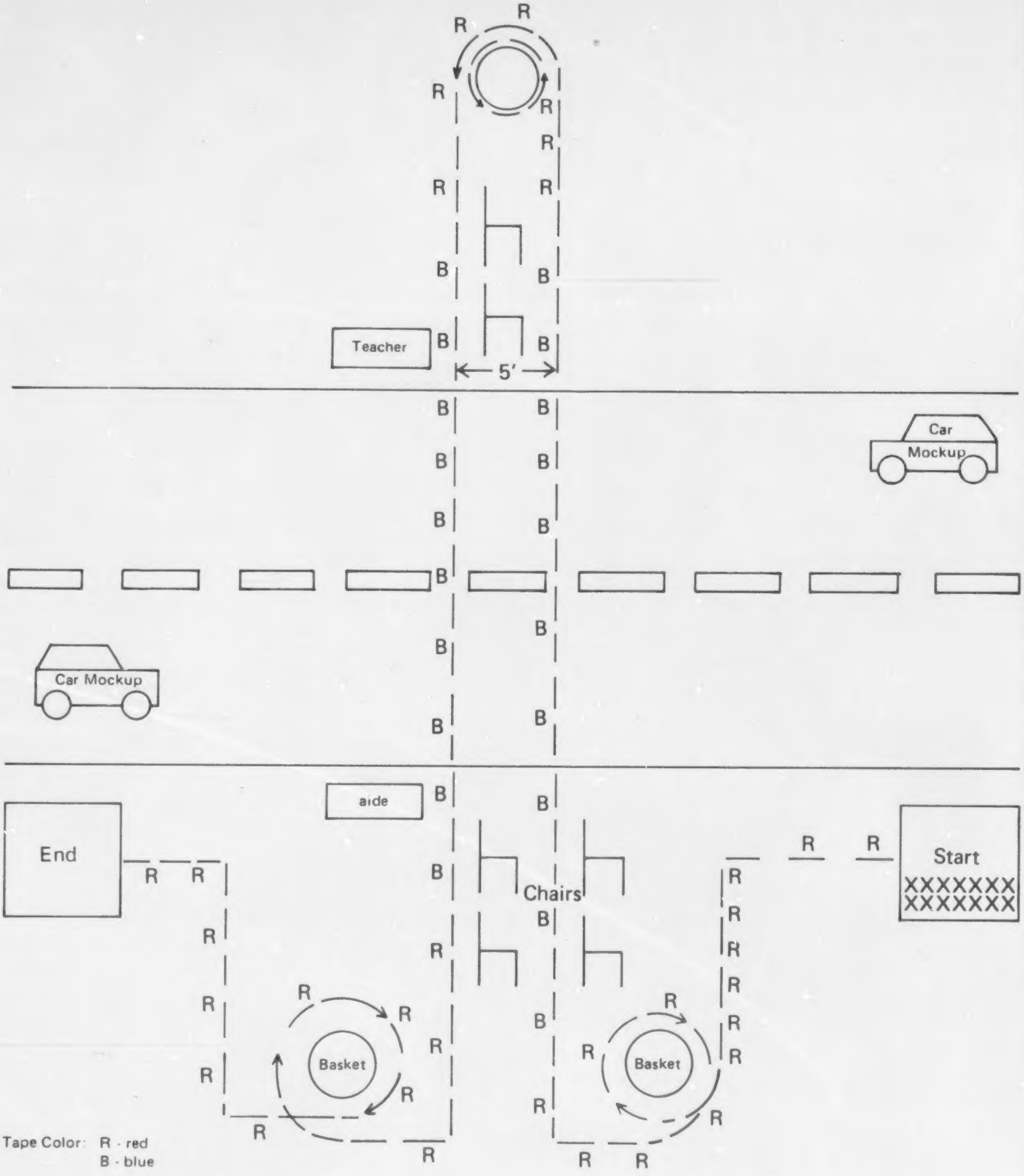
The teacher and aide check the children's performance of the correct street crossing behavior. If the player makes a mistake in performing the sequence, he/she loses one place in line.

As the players reach the end zone, the teacher gives them a safety token as a reward.

Halfway through the game, call "stop" and assign two children who have finished to be cars.

The game is over when all children have had a turn. Play the game a second time by having the child follow the course in reverse, i.e., from the end zone to the start zone.

Figure 2 Playing Area for "Follow-the-Leader" Game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Tape Color: R - red
B - blue

MINI-UNIT 6

LEARNING HOW TO BE SAFE WHILE BOATING

Water-based recreation is becoming more and more widespread. In today's affluent society, many families own boats and use them frequently. It becomes very important, therefore, for all members of the family to be aware of the basic rules of boating safety. To know how to swim is important, but it is not enough: you cannot save yourself by swimming in most boating accidents. In fact, trying to swim for safety is often the worst thing to do in an accident.

Boating safety is all the more important because there are as yet no licensing regulations that require a minimum age and basic skills before a person can drive or sail a boat. Each person's safety in a boat is still a matter of his or her own knowledge, skill, and prudence.

Major concepts treated in this unit are

- Safe boating requires certain standard equipment.
- It is important to know the proper behavior for safe boating.

MINI-UNIT 6 LESSON PLAN

Learning how to be safe while boating

Activity #	*Activities*	*Class Time*
19	DESCRIPTION: Students collect, look at, and handle various safety items that a boat is required to have and learn how to avoid common unsafe boating practices. OBJECTIVE: To demonstrate knowledge of safe boating practices.	1-2 periods
20	DESCRIPTION: Students role play a family involved in a boating incident. OBJECTIVE: To learn how to prevent a boating accident.	1 period

Total Class Time: 2-3 periods.

ACTIVITY #19

Mini-unit Topic: Learning How To Be Safe While Boating

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students collect, look at, and handle various safety items that a boat is required to have and learn how to avoid common unsafe boating practices.

Objective:

By the end of the activity students will be able to demonstrate knowledge of safe boating practices by explaining the proper action to take in a given boating situation.

Concepts Treated:

- Safe boating requires certain standard equipment.
- It is important to know proper behavior for safe boating.

Materials Needed:

Safety items for boats (see list below), a low table, several benches or chairs.

ACTIVITY

If possible, obtain safety items for boats; or if students' families have boats, students might be able to bring in some of these items from home. Decide in class which student is going to try to bring in what, so you don't get too much of the same thing. Things that can be brought in are

Personal Flotation Devices (PFD)--various sizes (child, adult) and various kinds (life jacket, life vest)

Paddles

Running lights--red and green

Flashlights for signalling

Whistles or horns

Fire Extinguisher

Marine Radios (optional in small boats)

Where possible and appropriate have the students use the safety items, e.g., put on the personal flotation devices or operate the radios to discover where the band with the weather forecasts is.

An option is to have a representative from the Coast Guard, the Coast Guard Auxiliary, or the state boating office lecture on the items and demonstrate their use.

Where items are too large or costly to bring in, the students can make drawings of them and describe their functions.

Next, students learn proper boating techniques for the following situations:

Boarding (getting on)

Loading (putting things on)

Capsizing (boat tipping over)

Disembarking (getting off)

Unloading (taking things off)

Person Overboard (falling off)

To demonstrate proper behavior when using a small boat--rowboat, small sailboat, canoe, small motorboat--place a large but not too tall table at the front of the room to use as the dock. Small benches, chairs, or stools which are lower than the table are placed alongside. After you have described the appropriate behavior for each situation which is outlined for you later in this activity (you may also find the pictures at the end of this activity helpful to your students in understanding this behavior) ask for volunteers or choose several students to demonstrate the desired behavior.

The equipment gathered for the first part of this activity should be used here. Students may then practice wearing PFDs, loading the boat with actual equipment, and learn the proper way to rescue someone who has fallen overboard.

Boarding

1. The number of seats in a boat does not indicate the boat can carry that many people. Seats are arranged so a boat can be loaded evenly. The number of people a boat can carry is less than the number of seats.

2. Board the boat one at a time.
3. Don't jump off dock, the boat may tip over.
4. Step down slowly and gently into the middle of the boat.
5. Keep weight low and move slowly from dock to boat.

Equipment loading

1. Don't drop equipment into boat. A person standing on dock passes equipment to person in boat.
2. If there is no helper, move equipment to edge of dock, board boat, then lift equipment off dock piece by piece.
3. Place equipment evenly in boat.

Behavior on a boat

1. If the boat is improperly loaded, someone may fall off.
2. If someone is sitting dangling legs in water or in an unsafe position (crosslegged, on bow, on gunwales) or standing, even a small wave may cause him or her to lose balance and fall overboard.

Capsizing

1. A boat can capsize if it is overloaded, or equipment or people are improperly balanced.
2. Capsizing is when a boat turns over and spills crew and equipment into water.
3. Stay with boat as long as it is floating--do not try to swim to shore. It's farther than you think.
4. If you are not already wearing a PFD, put one on.
5. Try to turn the boat rightside up and empty it of water, while floating alongside yourself.
6. If you can get the boat half empty then climb in--very carefully--and finish bailing.
7. Don't try too hard. Working in the water will make you very tired. If you can't get the boat upright and empty save your energy and signal for help.

Disembarking

Leave a boat in the same manner you board it, keep weight low, move slowly.

Unloading

Unload a boat in the same manner you load it, piece by piece and preferably with the help of a person standing on the dock.

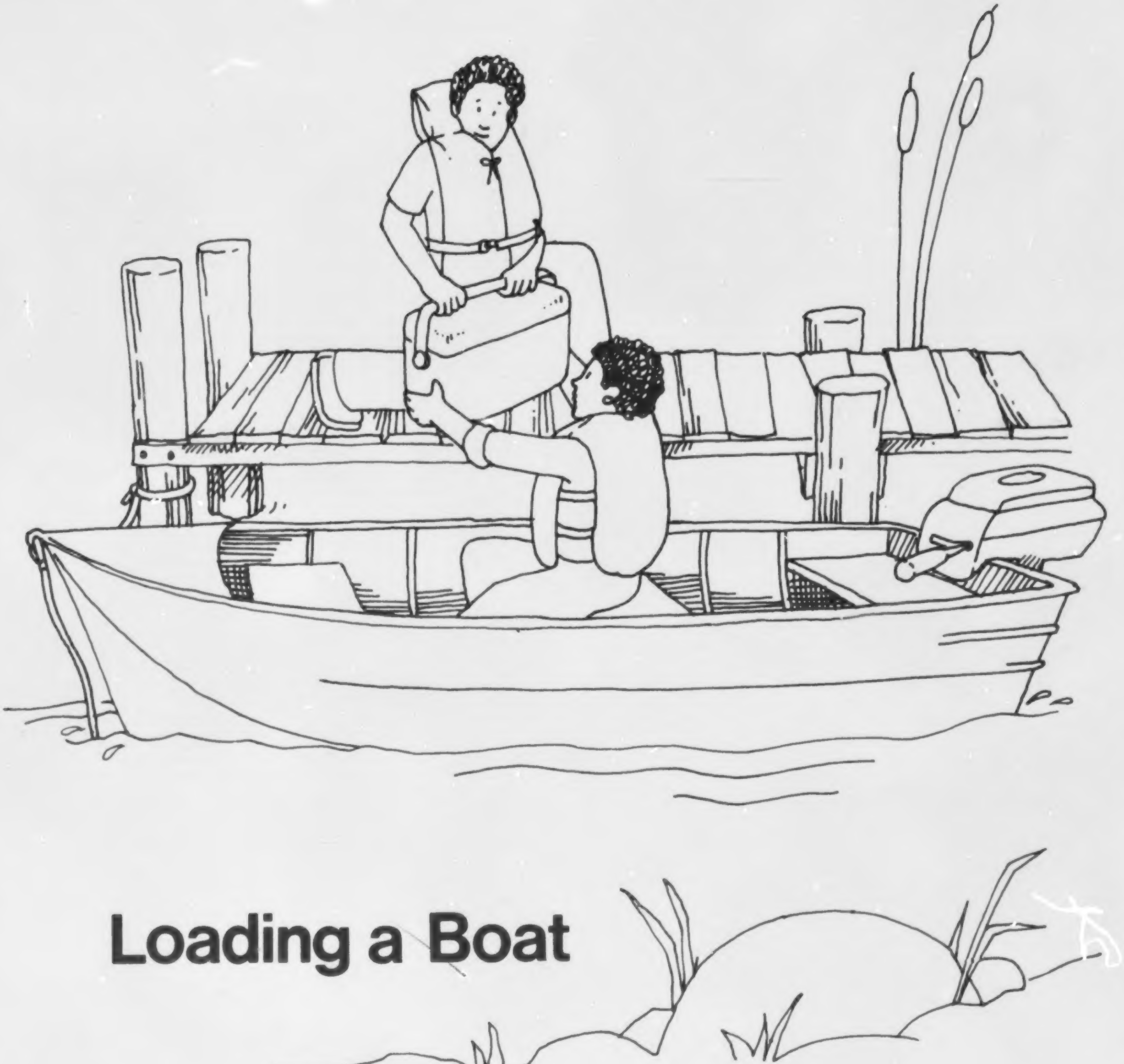
If someone fall overboard

1. Call out "Person overboard!"
2. Throw a buoy or cushion or ring buoy near--not at--the person in the water.
3. If you don't have such items on board, extend an oar or paddle to the person.
4. Never take your eye off the person in the water.
5. Never dive into the water after the person.

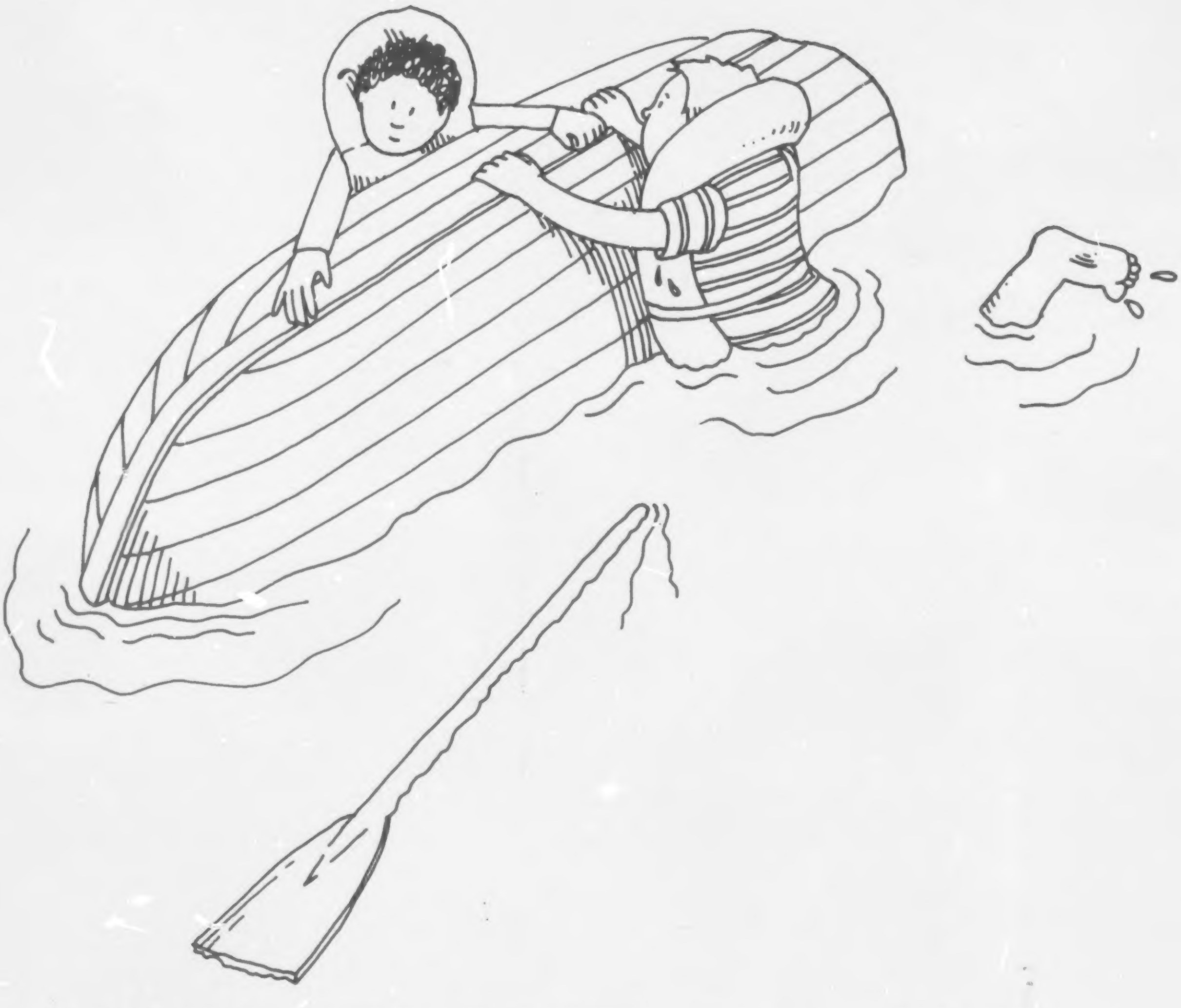
Things to remember or do before going out in a boat

1. Never go out without proper equipment, especially PFDs.
2. Learn to swim before you take up boating.
3. Go out with someone who knows how to operate the boat well.
4. Check the weather.
5. Never go out alone. If you must, leave a float plan, where you expect to go and when you expect to return.

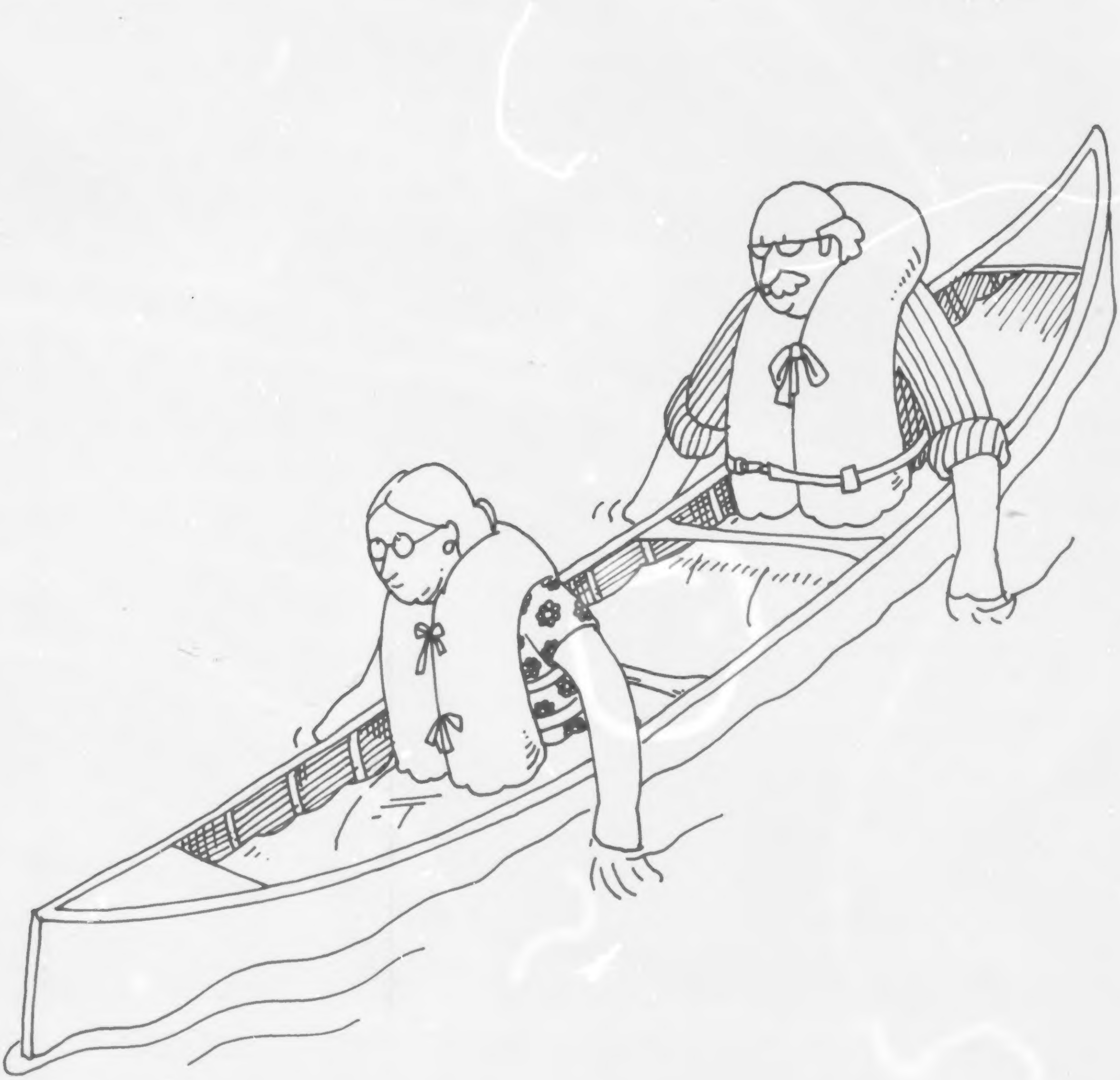
Safe Boating



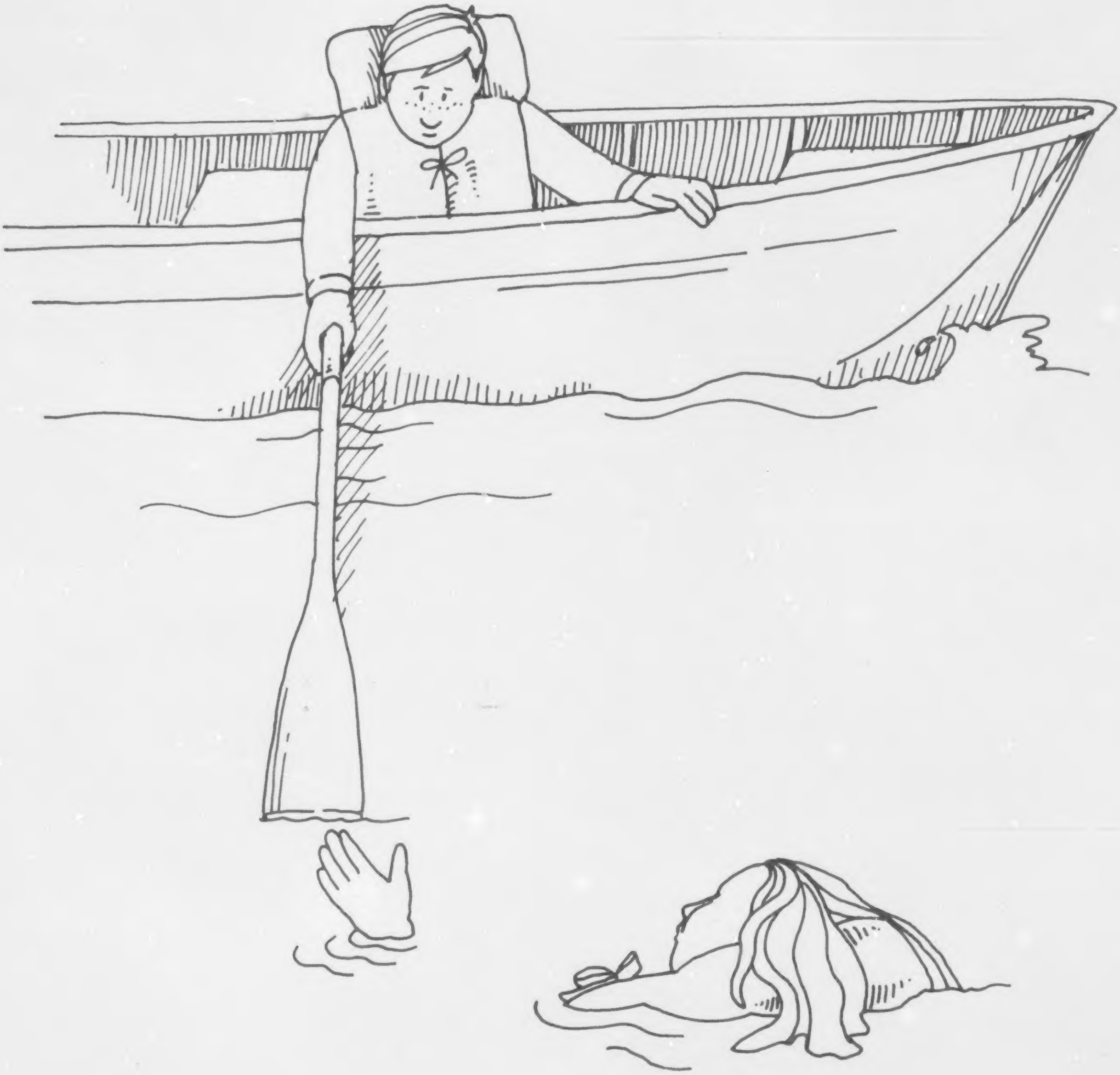
Loading a Boat



CAPSIZED BOAT – stay with it



Swamped Canoe



PERSON OVERBOARD-extend oar

ACTIVITY #20

Mini-unit Topic: Learning How To Be Safe While Boating

Approximate Class Time: 1 period

Capsule Activity Description: Students role play a family involved in a boating incident.

Objective:
After completing this activity students will be able to tell what is wrong with a given unsafe boating situation and explain what should have been done to prevent this situation.

Concept Treated:

- It is important to know the proper behavior for safe boating.

Materials Needed:
A low table, several benches, and chairs.

ACTIVITY

Set up the front of the room as you did in the previous activity, adding two chairs off to the left and behind the dock.

Assign or ask for volunteers for parts in a boating role play: two children, mother, father. Send these students out of the room. Read all three role profiles (attached) to the class so they may have an overview of the role play prior to its being acted out. While you are reading the profiles, ask the class to think about how they would handle the situation if they were the children, and then again as the parents.

Bring the two students who are acting as the children back into the room. Tell them they are to act out the role profile as if they were the children being described. Read them the profile. The students act out their roles.

Next bring the mother and father back into the classroom while the children are still in the boat. Tell them to sit on the two chairs (the automobile). They then act out their role profiles, simultaneously, after reading them silently to themselves (neither sees the other's profile) or after you have read them to each student one at a time without the other hearing.

After the completion of the role play, the class comments on its realism and then the whole group discusses some or all of the following points.

- Were the children doing anything wrong? Why or why not?
- What did you think of the children's behavior while in the boat? Safe or unsafe? Did they have the proper equipment with them?
- Why was the father worried?
- Did the parents act appropriately when they saw their children in the boat? If yes, why? If not, how should they have acted?
- How else could the children have retrieved their lost oar or have gotten to shore without it?
- Do you think those children will ever go out in a boat alone again without first getting permission?
- Would you ever do what those children did? Why or why not?

Role Profiles

Two Children

It's a hot day in July. The two of you have nothing to do this afternoon because your parents have gone to your cousin's wedding. Kids weren't invited. What a drag. Your father put the row boat in the water this morning. He had promised to take you out for your first ride of the season but there wasn't enough time before he had to leave for the wedding. You don't see why you can't go out without him. You both rowed the little boat at least once or twice last summer with your father. It wasn't hard at all.

You take the oars out of the shed by the side of the house. You head for the dock where the boat is tied. Your father always made a big deal about the proper way to act around boats. You figure if you are very careful nothing will happen and you won't get caught or punished. This is going to be fun.

Once you get in the boat all you have to do is put the oars in the oar locks, like that. Push off from the dock. And row. Nothing to it. Oh no, there goes an oar. Right out of the boat and into the water. It's even floating away.

Mother

You wish you could have found a better babysitter for the kids. Mrs. Crane always says she loves to sit for the children, but she really isn't very careful about watching them. Unfortunately you had no choice today but to ask her. You couldn't very well miss your own niece's wedding. You still can't help but worry about them. You'll be glad when you get home.

It's not far now. In fact, when you go around the next corner you'll be able to see the lake. And there it is. The lake with the mountain looking down on the water, the pine trees hugging the shore. And, oh my gosh, aren't those your kids out on the lake in the row boat?

Father

You can't believe that you didn't warn the kids about not using the row boat while you were at the wedding. How stupid could you have been? But they're good kids and they wouldn't do anything so dumb as to go out in the boat by themselves. They were, however, terribly disappointed this morning when there wasn't time to go for a quick ride. Maybe the oars are still in the basement in the back closet where they have been stored all winter.

It's a good thing you never mentioned to your wife that you put the boat in the water this morning. She would be a nervous wreck thinking the kids might have rowed off into the sunset or something. You kids would never do a thing like that.

Well, you're almost home now. Still you must admit you will be happier when you see the kids sitting in front of the television set. There's the lake. Just another few feet to the driveway. Oh no! What are the kids doing in the row boat on the lake? And with only one oar!

MINI-UNIT 7

LEARNING ABOUT EMERGENCY VEHICLES

Students of all ages need to be aware of what emergency services are available if they are in serious trouble. At the same time they must know how to obtain these services. Furthermore, they need to learn that when an emergency vehicle is traveling, someone's life or health usually is in danger.

Major concepts treated in this mini-unit include:

- There are several different kinds of emergency vehicles used for different emergencies.
- There are many emotions that must be dealt with in an emergency situation so one can act appropriately and effectively.
- Knowing whom to call for help is necessary if one is to act quickly and effectively in an emergency.

MINI-UNIT 7 LESSON PLAN

Learning about emergency vehicles

Activity #	*Activities*	*Class Time*
21	DESCRIPTION: Students discuss the nature of emergency vehicles and learn how to obtain emergency services when needed. OBJECTIVE: After completing this activity, students will be able to name three kinds of emergency vehicles and identify the purposes for which each one is used.	2-3 periods
22	DESCRIPTION: Students role play their reactions to household and community emergencies. OBJECTIVE: After completing this activity students will be able to demonstrate knowledge of appropriate emergency behavior. Given an emergency situation students will identify the most appropriate person to call for aid and demonstrate how to do so.	1 period

Total Class
Time: 3-4
periods.

ACTIVITY #21

Mini-unit Topic: Learning About Emergency Vehicles

Approximate Class Time: 2-3 periods

Capsule Activity Description: Students discuss the nature of emergency vehicles and learn how to obtain emergency services when needed.

Objective:

After completing this activity, students will be able to name three kinds of emergency vehicles and identify the purposes for which each one is used.

Concepts Treated:

- There are several different kinds of emergency vehicles and they are used for different emergencies.
- The telephone is important to someone who is trying to obtain help in an emergency.

Materials Needed:

Telephone book, unlined paper, chips or pebbles.

ACTIVITY

As a class discuss what an emergency vehicle is. Vehicles* regularly involved in providing emergency services include

- Ambulances
- Police cars
- Fire engines
- Helicopters
- Coast Guard rescue boats

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*As part of your discussion you may find it helpful to use the illustrations of emergency vehicles which appear at the end of the activity. When showing the illustration of the ambulance you may want to ask your students if they know why the word "Ambulance" on the front of the vehicle is written backwards.

Next ask students what kinds of emergencies each of these vehicles responds to.

Ambulances: Give medical assistance to people who are critically insured or ill.

Police cars: Provide service to prevent injury or loss and assist ambulance service.

Fire engines: Aid in putting out fires.

Helicopters: Locate forest fires, assist in disaster situations, aiding people who are stranded, critically injured, or ill.

Coast Guard rescue boats: Provide service primarily to boats and their passengers who are in trouble or need help.

Finally, ask students if they or their parents, brothers or sisters have ever been involved in an emergency. Students describe the nature of the emergency and what they or the other people involved did to help alleviate the problem. After several students have related their experiences, raise the following issues with the class.

1. Is it important to know what to do in an emergency? Why or why not?

2. Is the telephone important in an emergency? How can it help you?

3. If there was an emergency and you didn't know whom to call for help, what could you do? (Dial the Operator for assistance and ask for the police.)

After this discussion it may be appropriate and necessary to review with your students how to use a telephone to obtain assistance in an emergency. To do so, use the following game.

Practice in Using the Telephone - A Game*

Review how to find telephone numbers in the telephone book by looking up numbers of the local police and fire departments.** Instruct

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*This activity has been revised from an activity developed by Dr. Marla Peterson, et al. The original activity is part of *Coping Behaviors Dimension Guide, K-6 Career Education*, U.S. Office of Education, Department of Health, Education and Welfare (Washington, D.C.: 1974) and has also been adapted and included in *Career Education Activities for Subject Area Teacher*, Grades 1-6 by Jane Lawson and Peter Finn (Abt Publications, Cambridge, MA: 1975).

**Some communities use the 911 emergency telephone number. If your community is one of these, explain why it is used rather than a regular phone number, and then use it in the game.

students in the proper way to read a telephone number if they do not already know. Three, nine, two, seven, eight, one, eight (392-7818) is the way a number is stated and read. As homework, students learn their home telephone numbers, if they have one. After writing the number on a piece of paper, students look up the numbers of the local police and fire departments in the telephone book and list them under their home number.

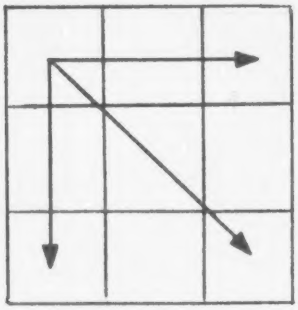
As a class, make up your own telephone book including each student's telephone number and the local numbers to call for emergency. Students write their own numbers on the chalkboard and read them aloud.

Next, give each student a piece of paper that can be folded or marked into 25 blocks, or 9 blocks if time does not permit the use of such a large board.

1- 8973	5- 1921	
7- 9248	O	
	3- 0124	

An O is put in the middle block for Operator. Students write in the blocks in random order the numbers that appear in the class telephone book. If there are not enough numbers in the "book" to fill the blocks, use telephone numbers of the school and well-known business firms in the area.

Slips of paper listing each number are put in a box or some other receptacle for the caller. As the numbers are called, the slips of paper are set aside. Keep a list of all numbers used in the game and check them off as called. Each player has chips or pebbles to cover a number when it is called and appears on the game board. The game proceeds as in Bingo. Once a student has covered a row of numbers running vertically, horizontally or diagonally, he or she yells "Buzz" (see diagram which follows).



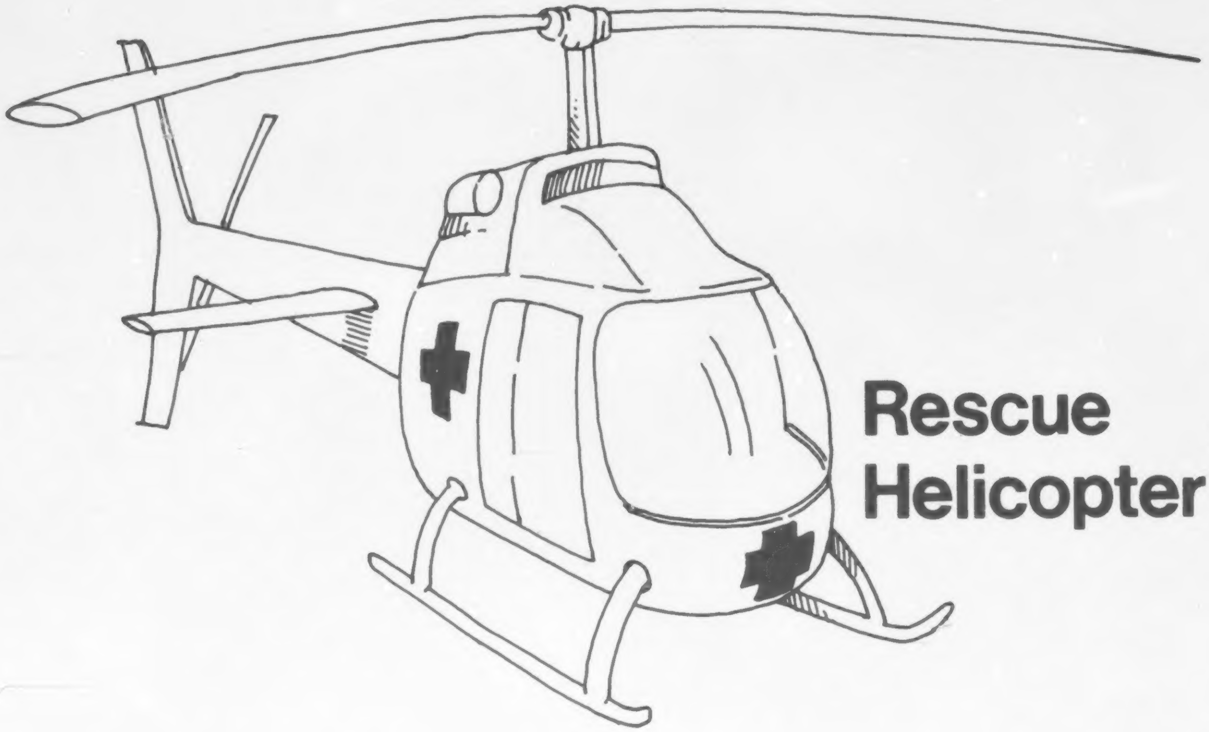
Students make up their own telephone lists of important numbers (fire, police, operator, parent's work number, doctor, relative). Numbers are copied onto a card which students can place next to their telephones at home.

Variations and Supplementary Activities:

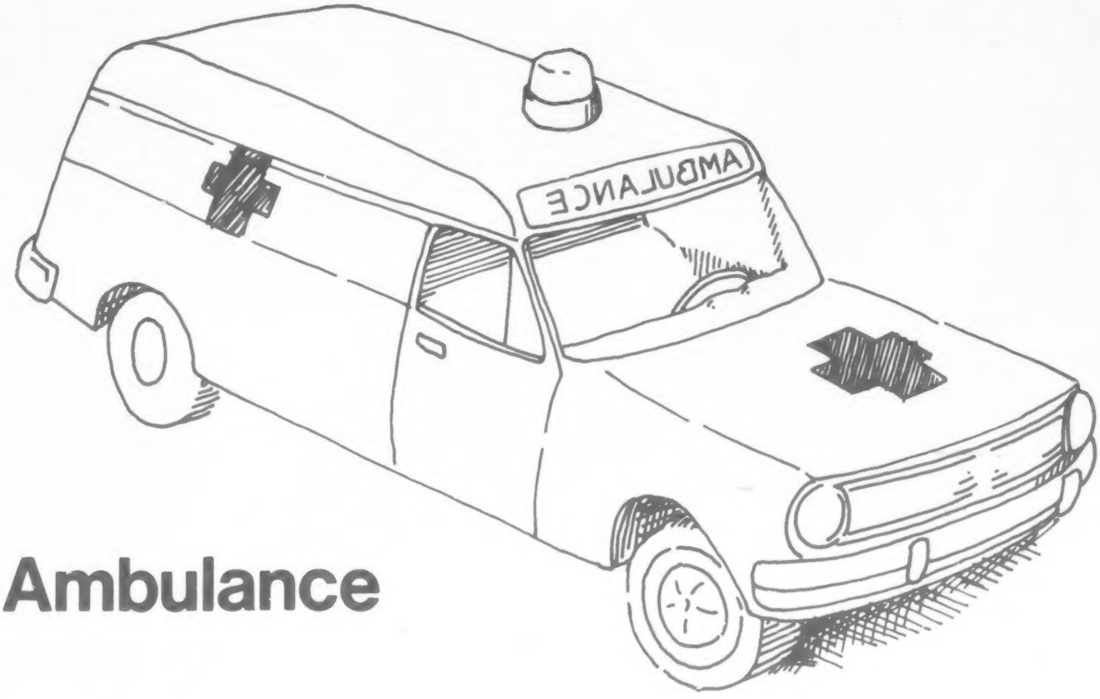
Students practice using the telephone: dialing, speaking clearly, giving appropriate information.

Students show a brother, sister or friend how to locate emergency numbers in the telephone book.

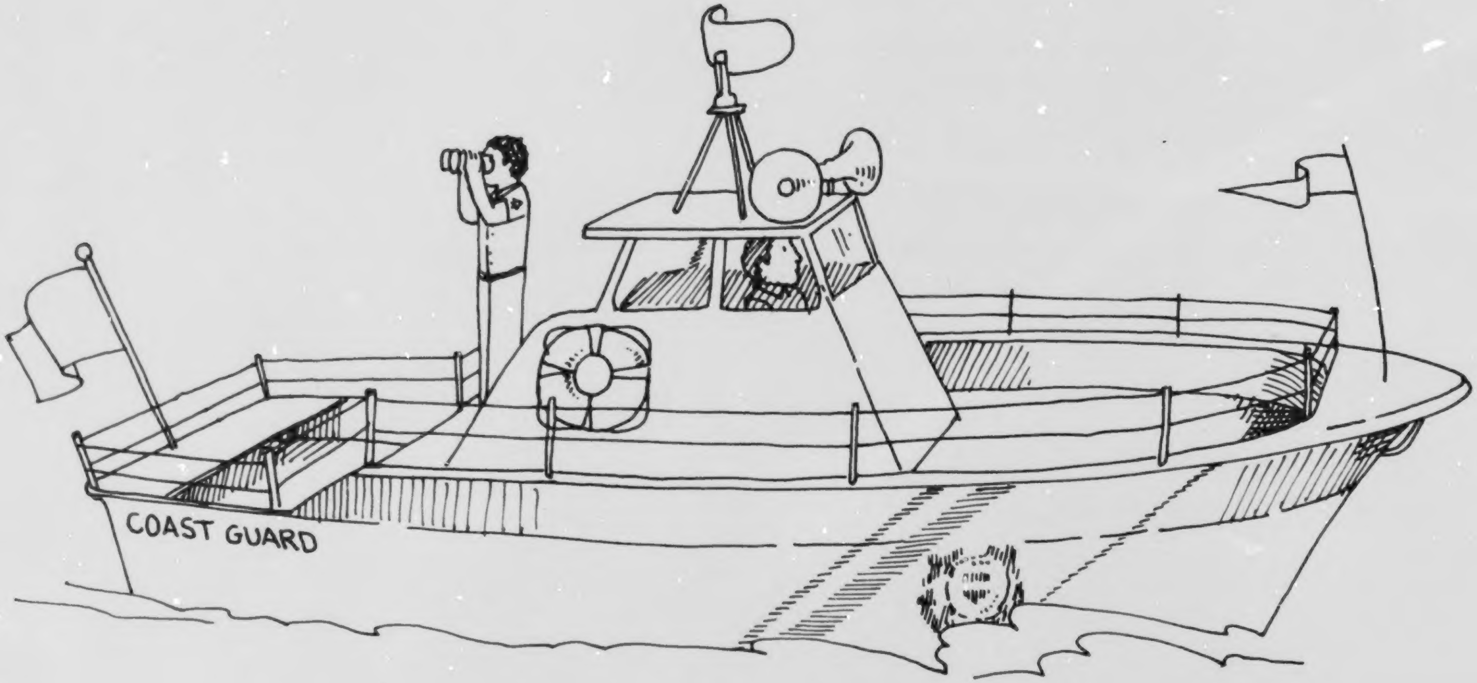
It may be simpler and less confusing to make the Bingo cards yourself and distribute them ready-to-use than having the students make them themselves.



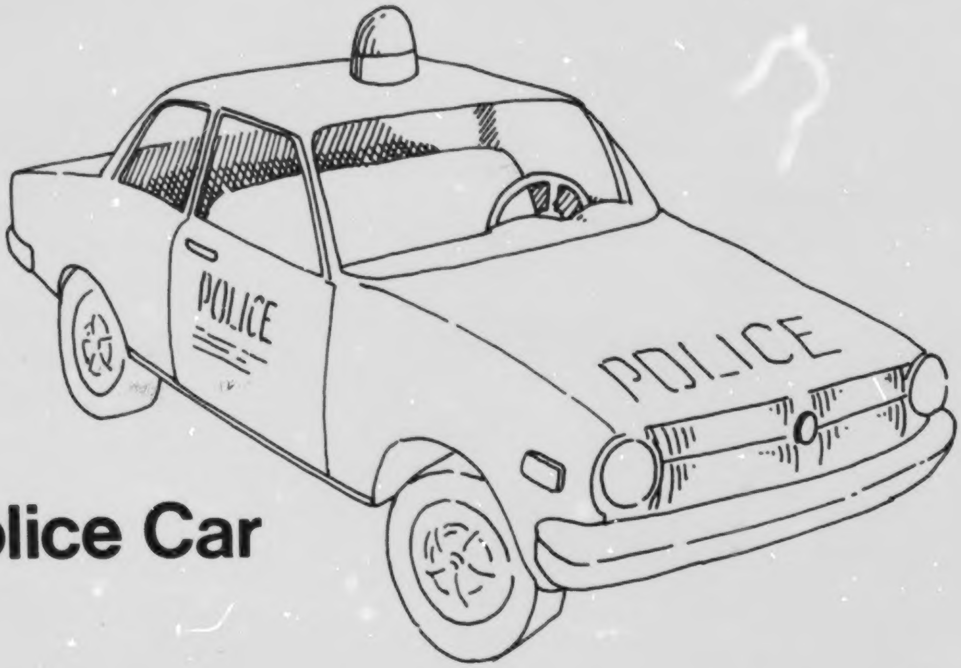
Rescue Helicopter



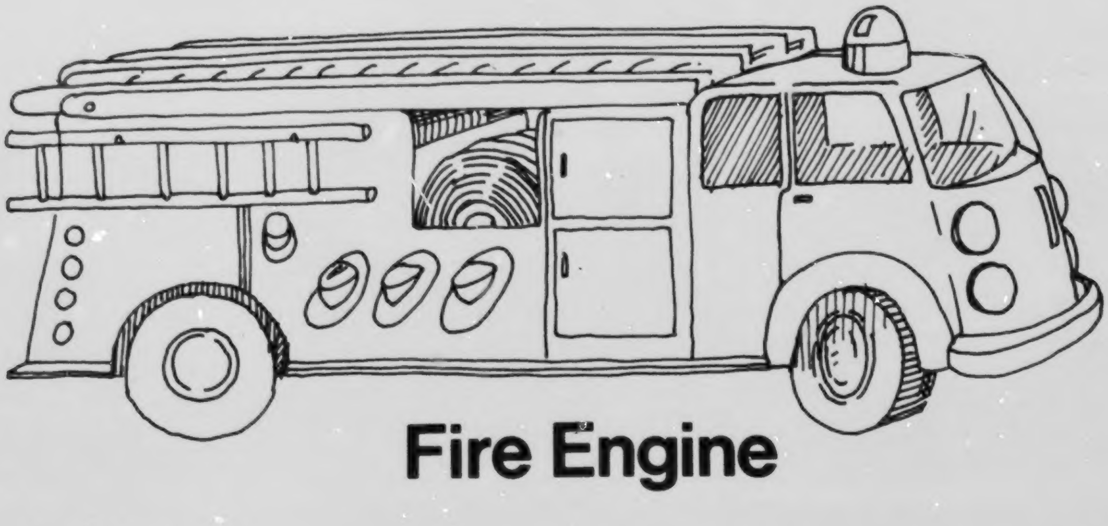
Ambulance


COAST GUARD

Coast Guard Rescue Boat


POLICE
POLICE

Police Car



Fire Engine

ACTIVITY #22

Mini-unit Topic: Learning About Emergency Vehicles

Approximate Class Time: 1 period

Capsule Activity Description: Students role play their reactions to household and community emergencies.*

Objective:
After completing this activity, students will be able to demonstrate knowledge of appropriate emergency behavior. Given an emergency situation, students will identify the most appropriate person to call for aid and demonstrate how to do so.

Concepts Treated:

- There are many emotions that must be dealt with in an emergency situation in order that one can act appropriately and effectively.
- Knowing what to expect in an emergency helps a person to act more appropriately.
- Knowing whom to call for help is necessary if one is to act quickly and effectively in an emergency.

Materials Needed:
Play telephone, telephone directory or card with emergency phone numbers, Crisis Cards (samples attached).

ACTIVITY

Discuss the following with the class:

- What is an emergency? Are there different kinds of emergencies?

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*Based on the game HELP!, Abt Associates Inc. (excerpted here by permission). Complete classroom kit available at $18.00 plus $1.50 shipping and handling from Games Central, 55 Wheeler Street, Cambridge, MA 02138.

- How do people feel (fear, panic, confusion) when they are involved in an emergency situation?

- What should a person do in an emergency? Discuss behavior and action to take in specific emergency situations.

- What emergency vehicles and services are provided in your community and for what purpose? (Illustrations of the various types of emergency vehicles can be found at the end of Activity #21.)

To reinforce appropriate emergency behavior, play the game that is described below.

One at a time, students are called upon to role-play their reactions to household emergencies, using a telephone and directory as props. The rest of the group will be an audience of critics, who evaluate how well the emergency was met and make impromptu suggestions.

Shuffle the Crisis Cards [samples include 2 role profiles pertaining to fire (cards #1 and #2), 2 pertaining to police (cards #3 and #4), and 3 to emergency crisis situations* (cards #5, #6, and #7)]. The student who is it leaves the room to stand just outside the door or some other "safe" place out of hearing.

Draw the first random card and read it to the group. You may wish to *briefly* discuss or embellish the situation prior to bringing the role-player back into the room. In no way, however, should the nature of the crisis be changed, but it may be made more realistic for the role-player.

Call the student back into the room, have him or her take the stage, and read the crisis aloud. Tell the role-player to go through all the motions of his/her response to this emergency, paying particular attention to the sequence of actions and the clarity, conciseness, and comprehensiveness of his/her verbalizations. When the student has completed the role play, ask the class to comment on it relative to these same points.

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*If your community has a Poison Control Center you may want to explain its function to the class and how they can use it in particular emergency situations.

1. After spending a hard day playing with your friends, and being the winner of the game, you start for home. You want to play again next week to show everyone that you really are the big winner, and there is no one around who can beat you. But you have a week to rest up. As soon as you walk in your house, you hear the water running in the bathtub. Taking a bath is not what a champion should have to do. But your mother seems to feel that you are dirty, and being the winner has nothing to do with that. So into the bathtub you go with your little brother (sister). You get the soap first and wash fast, so you can get out of the tub first. You leave your brother (sister) in the bathtub. You have just put on your bathrobe when you hear a lot of splashing and coughing coming from the bathroom. You go to open the door and find it is locked. (But you didn't lock it when you finished your bath.) You call for your mother. There's no answer. She must have gone next door for a minute. You call your brother's (sister's) name, but you don't hear anything. Is he (she) all right? Is he (she) not answering on purpose? You don't really know. What should you do now?

2.* You have been watching a trash truck take in all the things that people have thrown away. It doesn't look as if that truck could hold all the trash from the cans. But by the time the truck leaves your street, there is no trash to be seen anywhere. You watch the man next door come running out of his house, trying to get the trash truck to come back. The man looks angry. He goes back into the house and returns, bringing out four cans of trash, and lights the pile with a match. Black smoke starts to rise from the pile of trash. Your neighbor sees this, but he just turns around and walks back into his house. It doesn't smell very good to you. Suddenly the fire spreads to some leaves in the gutter. No one is home because your mother has gone to the corner store to buy some odds and ends. No one else is around. What should you do about this?

---

*This role profile is illustrated at the end of the activity. You may wish to have students react only to the illustrations provided or to some appropriate combination of illustrations and written role profile.

3. You have never heard the sort of noises from next door that you hear tonight. Not only are your neighbors yelling at each other louder than ever, but you begin to hear things breaking. All the time they are throwing things at each other, they continue to yell. If they keep this up, they will wake up your little brother (sister). Tonight you are babysitting because your mother couldn't find anyone else to come. (She said she would only be gone for about two hours.) You don't want your little brother (sister) to wake up because then he (she) will start to cry. Just as you decide to go next door to ask them to shut up, you hear the woman scream, the door slam, and footsteps running away. You are afraid that something terrible has happened next door, but you are afraid to go and look. What do you do now?

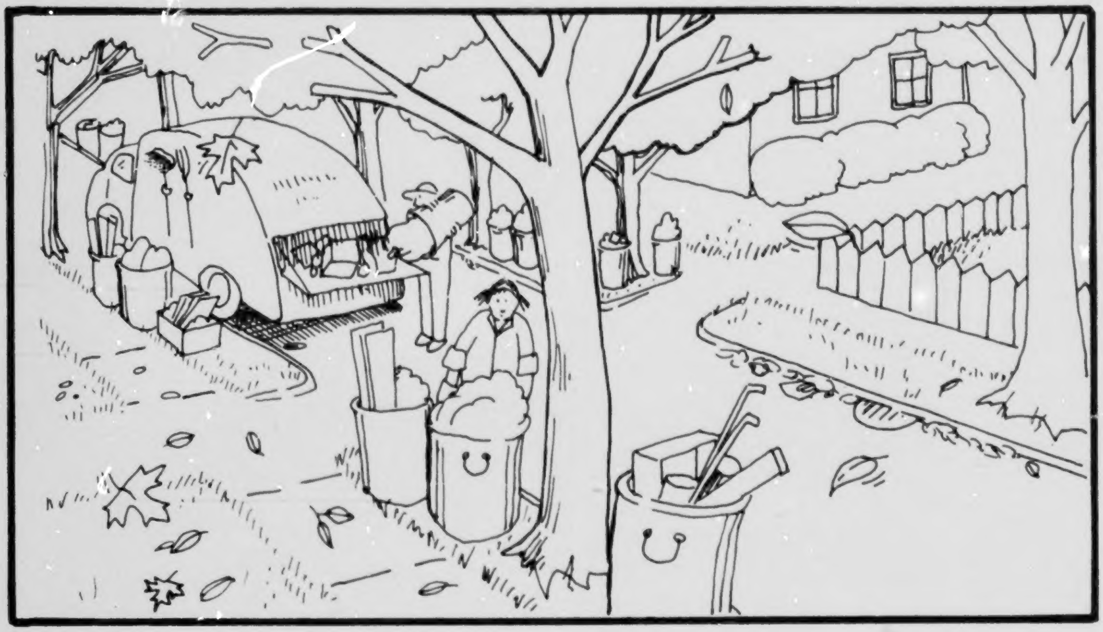
4. Some new animals have just arrived at the city zoo. You especially want to see the rhinoceros from Africa. You have heard that they sleep a lot, so you want to get there early and wait around until it wakes up. You meet your friend on the corner and you both start walking towards the zoo. You come to a street corner where there are four stop signs. Someone is crossing the street coming towards you. Out of nowhere comes a car, going very fast. You hear the squeal of brakes. The person who had been crossing the street towards you and your friend has been hit and knocked down by the car. The car didn't even stop! The person is still lying there in the street, and no one seems to be around except for you and your friend. What do you do now?

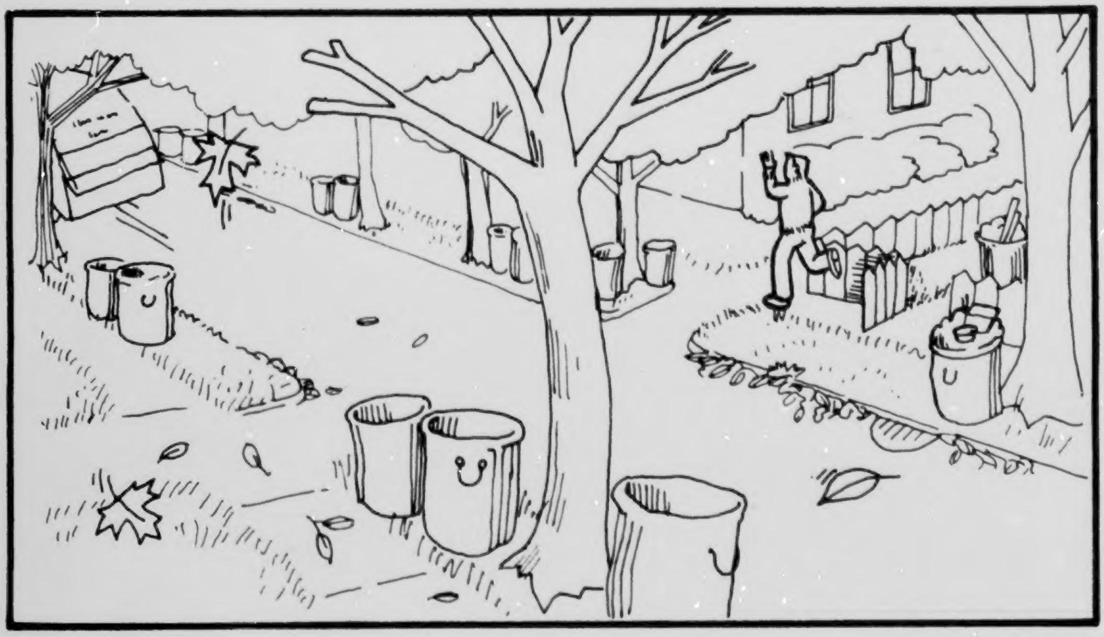
5. You see that still another day has gone by and no one has discovered your secret hiding place. All the things you love that you know your mother won't let you keep in the house are buried in the ground here. Today you are adding something new to your collection. You smooth over the ground after covering up the hole you dug. No one could ever guess that your treasures are here. You just hope that it doesn't rain. That might wash away the dirt, and your treasures won't be covered anymore. With that done, you head home. You notice something large lying in the street. It isn't moving. As you come closer you notice that it is a person! Doesn't he have a bed to lie in when he is tired? But that can't be it. It isn't dark yet. You see the old man holding his hands over his chest. Is he sick? What should you do now?

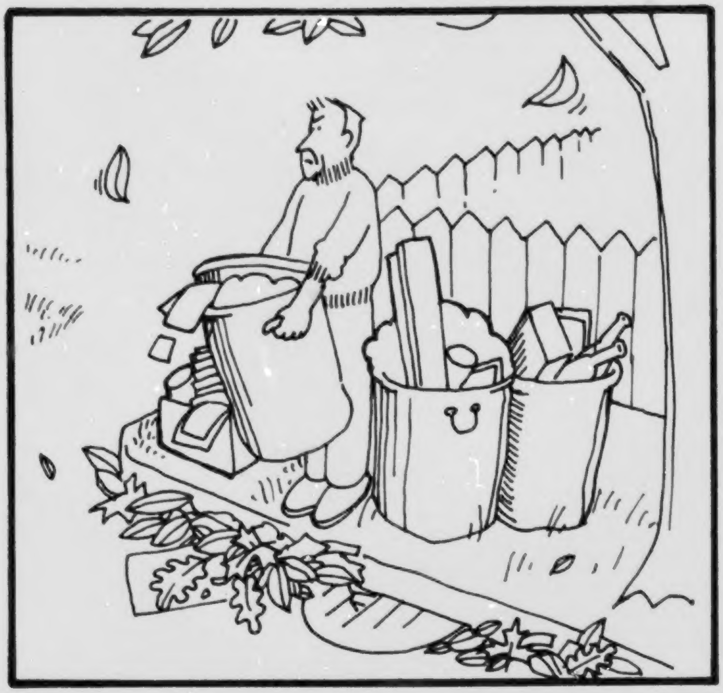
6. Spring has finally come. The flowers are blooming and the birds are singing in the trees. You can go outside without a jacket now, and you can play longer because there is more light. All the snow is gone from the roofs of houses and from the streets. But spring also means that it is time to clean the house, and you are old enough to help. All the things your mother needs for cleaning are set out. If only your little brother (sister) would take a nap so you clean what you are supposed to. He (she) keeps getting in your way. Your mother has gone out to buy some sponges so you can help her. Now you are using her sponge in the kitchen. All of a sudden you hear loud crying coming from the bathroom. You rush in to find your little brother (sister) holding a bottle of ammonia. It is only half full now, and you know your mother had just bought it. What do you do now?

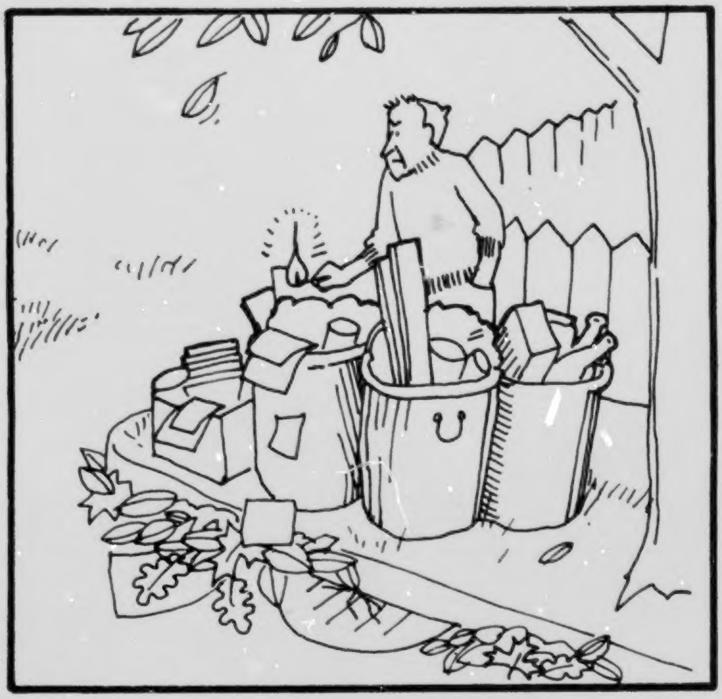
7. How many times must you tell your mother that eating lettuce makes your stomach hurt? And how many times has your mother said that unless you eat the vegetables first, you won't get any ice cream? You've tried holding your nose when you have to eat the lettuce, but that doesn't seem to help either. And your mother isn't very happy when you do that. So there you sit, watching your mother cut up the vegetables for dinner. You hope she'll finish soon, so maybe there will only be enough for her. Suddenly the knife slips. Your mother has cut her hand badly. She puts her hand under the cold water in the sink, but the bleeding doesn't stop! How can you help her? She can't even dial the telephone, with that cut on her hand.

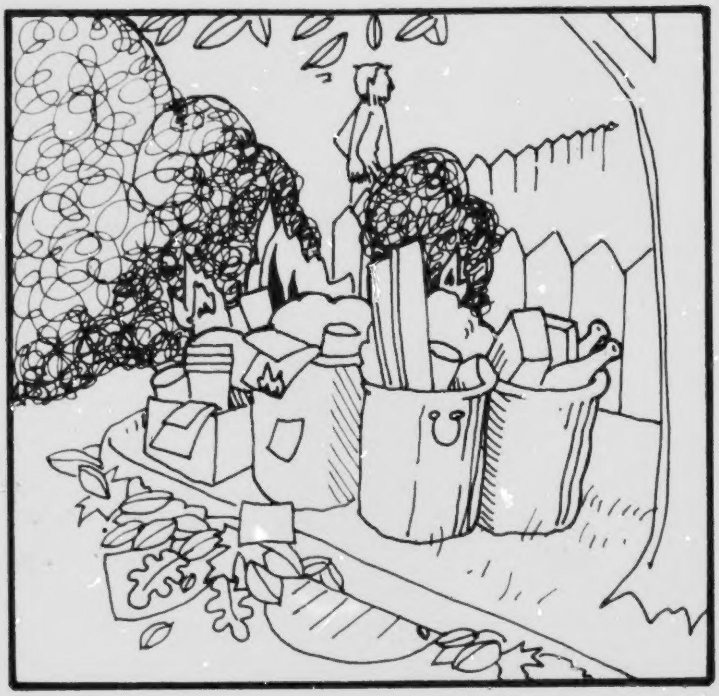
WHAT'S GOING ON HERE?

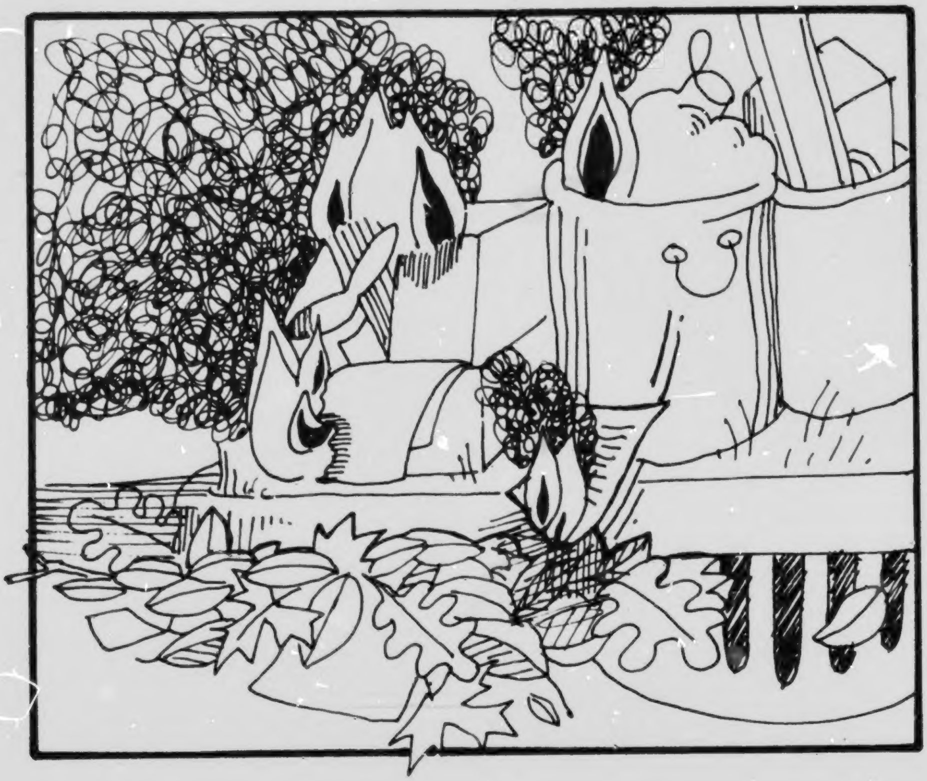












WHAT SHOULD
YOU DO
ABOUT THIS
?

MINI-UNIT 8

LEARNING ABOUT SAFE TRAVEL BEHAVIOR

The preceding mini-units have dealt with automobiles, pedestrians, boats, and emergency vehicles. However, those are not the only forms of transportation that people use which involve their safety. This mini-unit deals with other forms of travel, stressing that all have their special hazards but all can be used safely if certain rules are followed.

Among the major concepts treated in this unit are the following:

- There are many different kinds of transportation which we use regularly in our daily lives.
- There are safety precautions to take or remember for each way we travel.

MINI-UNIT 8 LESSON PLAN

Learning about safe travel behavior

Activity #	*Activities*	*Class Time*
23	DESCRIPTION: Students listen to a story, then discuss safety issues related to several modes of travel. OBJECTIVE: After completing this activity, students will be able to recall three kinds of transportation mentioned in the story and one safety precaution to take using each.	1 period
24	DESCRIPTION: Students take a field trip to a rail yard, railroad crossing or subway station to observe precautions they and others should take regarding rail safety. OBJECTIVE: By the end of the activity, students will be able to list two dangers of playing or standing by rail or subway tracks and two rules for safe behavior when around rail or subway tracks.	2-3 periods
25	DESCRIPTION: Students play a card game and a board game which teach the difference between safe and unsafe travel behaviors. OBJECTIVE: After playing one or both games students will be able to name three unsafe travel behaviors and the corresponding safe behavior.	½-1 period

Total Class
Time: 3½-5
periods.

ACTIVITY #23

Mini-unit Topic: Learning About Safe Travel Behavior

Approximate Class Time: 1 period

Capsule Activity Description: Students listen to a story, then discuss safety issues related to several modes of travel.

Objective:

After completing this activity, students will be able to recall three kinds of transportation mentioned in the story and one safety precaution to take when using each.

Concepts Treated:

- There are many different kinds of transportation which we use regularly in our daily lives.
- Safety must always be a factor to consider when traveling.
- There are safety precautions to take or remember for each way we travel.

ACTIVITY

Students listen to the story found at the end of this activity. Present the story, asking students to fill in the missing word or words as described by you with sounds or pantomime or using some other appropriate method of description. As students call out the missing words, write them on the chalkboard. At the end of the story, you may wish to check the answers and review any words students found particularly troublesome.

Keeping the list on the chalkboard for students to refer to, discuss Andrea's trip in light of the various transportation vehicles she and her family encountered and the safety factors the students perceive to be associated with each one. Sample discussion questions follow.

Automobile--What are some of the things you should remember to do when riding in a car? Should everybody wear a safety belt? Do you think everybody does wear them?

Fire Engine--How do fire engines help us? How can we help them?

Airplane--Why do people wear seat belts on an airplane?

Bus--Should we be aware of our safety when riding on a bus? Why or why not? What might have happened if the bus Andrea and her family were riding on was very crowded, people standing in the aisles, and the driver suddenly slammed on the brakes?

Elevator--What could possibly be unsafe about an elevator? What do you think Andrea would have done if on one of her trips to the hotel basement she got stuck in the elevator alone?

Boat--What might be a good thing to know how to do before taking a boat ride?

Bicycle--Could a bicycle ever be a dangerous vehicle? Why or why not? Should Andrea's father have checked his bike before going on the trip?

Ask students to describe, orally or in a drawing, any trips (long vacation trips or short jaunts around town) they have taken *via* some mode of transportation. Students relate the portion or portions of their trips that they remember most vividly. The class then discusses if these events in any way relate to safety and if so, how.

The class discussion will indicate your students' awareness or lack of awareness of safety issues and their concerns for same, and may help you focus your attention on a particular area of transportation safety to study with your students.

Variations and Supplementary Activities:

Students can make up their own stories and record them on a tape recorder to play for other students and other classes.

Break students into groups. Give one student in each group an idea for a story which he or she starts. One at a time, the other students in the group build on the story or idea of the preceding student. A tape recorder might prove helpful and fun for the story projects. Tapes can be exchanged among the groups and students discuss each other's stories.

Andrea's Trip

Instructions to be read to students prior to reading the story:

I am going to read a story told with words and sounds and actions. In several places, something has been left out of the story and replaced with the sound it makes. There will be a pause in the story after each sound or action. Call out--but softly please--the name of the vehicle or thing you think makes that sound. I will write the name of the vehicle or thing on the chalkboard as you call it out. Before we start, I'll show you what we mean.

> "Dad and I were driving in the car one day, when all of a sudden we heard a siren behind us. I was sure it was a police car, but when I turned around I saw a police officer on a ____________________ (motorcycle)."

That one was easy. Let's see how well you do with the story.

Dear Diary:

It has been a long time since I have written in you, but I have been very busy. I have been on vacation with my Mom and Dad, and my sister Sylvia. We are back home now and I want to tell you all about the terrific vacation we had in Canada.

Last Saturday morning the whole family was awake at 5:30. We had to get up that early because we were supposed to be at the airport at 7:30. We got dressed, had breakfast, and carried our suitcases out to the garage, where we all got into the ____________________ (car) for the trip to the airport.

On the way to the airport, we spotted a lot of smoke in the sky. Just as we were trying to guess where the smoke was coming from, two ____________________ (fire engines) went by and turned off the highway at the next exit. As we got to the top of the hill, we could see a building not far off the road, burning. The fire looked pretty bad. I was glad the fire engines were on their way to put it out.

When we got to the airport, we went right to the terminal and gave our luggage to the baggage attendant. I liked watching the suitcases move along the ramp all by themselves, then disappear through a little door in the wall. By this time, though, I was so excited I could hardly stand it--I thought we would never be allowed on the ____________________ (plane). It seemed like we had been waiting forever. Finally, the doors opened and we were told we could board the plane. Almost the first thing I noticed when I sat down in my seat was a funny clicking sound all around me. It wasn't until I saw the little sign over my seat which said ____________________ (fasten seat belts) that I figured out what it was.

Take-off was exciting and I really liked flying above the clouds I guess we were going very fast, but I could hardly tell if we were moving at all. Sylvia and I played cards, and looked at magazines, and made friends with the kids sitting in front of us. Before I knew it, the little sign over my seat came on again, telling me to __________________ (fasten seat belts). I knew we would be landing soon.

Mother was very pleased with Sylvia and me. We had only one small fight on the plane, but other than that, we were perfect children as Mother likes to call us when we are exceptionally good.

After we found our suitcases, we followed Dad outside where we waited with a bunch of other people for a ride to our hotel. When the ____________________ (bus) pulled up, we were the first to get on, so we were able to sit right behind the driver. The ride to the hotel was very short because we were on an express bus. I think that's a bus that doesn't make very many stops. I have a feeling that Dad thought the bus ride was a little too short, because he kept leaning forward in his seat to tell the driver to slow down. The driver must have had a hearing problem because he never answered Dad, and he didn't slow down much either.

The first afternoon we spent in Canada, Mom decided it would be fun to take a ride around the harbor. Sylvia and I changed into our shorts, Mom grabbed the camera, Dad made sure he had his wallet, and off we went. We found the pier easily and got right on the ________________ (boat). The boat took us all around the harbor and even served ice cream. I had a chocolate cone and Sylvia had vanilla. But the best part of the boat ride was when we went under some railroad tracks that crossed the water and a ____________________ (train) was going by at just the same time.

The next day Mom thought it would be nice to explore the countryside. She suggested we hike out to a nearby lake, but Dad thought it might be more fun if we rented bicycles and rode there. We had a great time on the way out, but on the way back, Dad's bike got a flat tire. Boy, was he mad! All the way home, he kept saying, "Why didn't I check the tires? Why didn't I check the tires?" I don't think he'll ever again forget to check the tires.

One of the best things that I did by myself was to take the elevator down to the hotel basement to watch the big ______________________ (truck) back up to the building to deliver food for the hotel restaurant. I had never seen so many carrots and tomatoes and oranges and heads of lettuce in my whole life. And I never knew people could eat so much food.

The rest of the week we spent swimming and hiking and sightseeing. But we didn't do anymore bike riding. We had a good time. Even Dad got over his flat tire and had fun. I wasn't bored once and nobody had any big fights. I hope we can go back to Canada again sometime.

Love,

Andrea

ACTIVITY #24

Mini-unit Topic: Learning About Safe Travel Behavior

Approximate Class Time: 2-3 periods

Capsule Activity Description: Students take a field trip to a rail yard, railroad crossing, or subway station to observe precautions they and others should take regarding rail safety.

Objective:

By the end of the activity, students will be able to list two dangers of playing or standing by rail or subway tracks and two rules for safe behavior when around rail or subway tracks.

Concepts Treated:

- Rail yards, railroad crossings, and subway stations can present safety hazards.
- There are precautions to take when around rail or subway tracks to ensure safety.

ACTIVITY

Begin this activity by identifying and discussing as a class some of the hazards of trains and subways and some of the safety aspects of both. Some of the things you can discuss include:

1. Why are railroad tracks and subway stations and tracks dangerous places both to wait and play?
2. Is there anything to prevent you from playing on the railroad tracks?
3. What barriers exist to prevent cars from crossing railroad tracks when a train is approaching?
4. What kind(s) of warning(s) is given to drivers and pedestrians?
5. Is this warning easy to understand?
6. Can pedestrians, bicyclists, or cars get around the barriers? Would they try?

7. Is there anybody to protect you from getting hurt when you are getting on or off a train or subway?

Students may not know the answers to many of these questions. You may wish to discuss them only briefly with the class at this time, waiting to have them answered in more detail on the field trip described below.

Next, divide the class into pairs. Each pair of students makes up two questions it would like answered about rail yards, trains, or subways. At least one of the two questions should relate to safety. Students present their questions to the class. Duplicates are discarded, and questions are discussed for appropriateness. Enough questions are retained so that each pair of students has at least one question to ask of the field trip speaker or guide.

Following the trip, students discuss what they saw and make up rules for safe behavior around rail or subway tracks.

Variations and Supplementary Activities:

If a field trip is not possible, students can send their questions to a railroad or subway official to be answered by mail.

If a field trip is not possible, you can try to secure the services of an appropriate railroad or subway official as a guest speaker.

ACTIVITY #25

Mini-unit Topic: Learning About Safe Travel Behavior

Approximate Class Time: ½-1 period or free time activity

Capsule Activity Description: Students play a card game and a board game which teach the difference between safe and unsafe travel behavior.

Objective:

After playing one or both games students will be able to name three unsafe travel behaviors and the corresponding safe behavior.

Concept Treated:

- For every unsafe travel behavior there is a corresponding safe behavior.

Materials Needed:

Playing cards, game board (provided at end of activity); playing pieces (e.g., buttons, erasers, chalk, pebbles).

ACTIVITY

Card Game

This card game illustrates people in situations which they may or may not realize are unsafe and asks students to match the unsafe behavior card with the card illustrating the more correct and safer behavior in the same or similar situation. For example, children playing in the street and children playing in a playground would be a matched pair.

The student who has the most correctly matched pairs at the end of the game is the winner. The loser is the student left holding the card with the "Unhappy Face."

Prior to playing the game, go over all the cards and their associations with the class. Discuss each card in light of what is wrong or right with it and why.

*How to play** (Go over the directions with students prior to play.)

Deal out all the cards** to the players. Each player looks at his or her hand, locating all the pairs. These pairs are placed face up on the table in front of the player. The situations illustrated on each card are briefly described by the player discarding them, indicating the unsafe and corresponding safe behavior. If the match is correct, the pair remains on the table; otherwise, the cards are returned to the player's hand. After each player has cleared his or her hand of all pairs, the student to the left of the dealer starts the game by drawing a card from the hand of the student on his or her left and so on, in turn, around the table. Each time a player draws a card, he or she clears his or her hand of any pairs, again briefly indicating the safe and unsafe behavior illustrated on the matched cards. Remind students that it is best not to let it be known when the Unhappy Face has been passed from one hand to the next.

A player drops out of the game once his or her hand is empty of all cards.

The cards are numbered for ease in checking correct matched pairs. A list of the correct pairs by numbers follows, along with a brief description of each card.

Board Game

Students exercise their understanding of the difference between safe and unsafe habits by playing a simple board game. Materials required include a small game board, a set of cards (both provided on the following pages) and a die.

Class breaks into small groups of three or four students. If possible make copies of the attached game board and cards and give each group a set of game materials. If it is not possible to make additional copies of the materials, game can be played by the students in their free time. The first time the game is played, the students cut out and color their own safe (smile)--unsafe (frown) cards and paste the game "board" onto cardboard*** for durability. Each group will need a die to determine the number of boxes to move on the board. Instructions appear on the following game "board."

---

*Played like "Old Maid."

**It may be wise to back the attached playing cards with cardboard for durability.

***Manila folders also work well as backings for the game boards and when students finish playing, the game and its pieces can be stored in the same folder.

Read the directions aloud to the class to ensure that students understand the rules. Depending on your students, you may also wish to discuss each picture on the gameboard prior to playing.

A game key indicating which pictures depict safe and unsafe behavior has also been provided. Students should be allowed to check their safe and unsafe situations with those on the key at the end of the game or if a dispute arises.

Variations and Supplementary Activities:

Students write or tell a story based on one or more illustrations chosen from the game board.

Students make their own safety card game and/or add to the cards provided in this game.

Card Game

Game Key (correctly matched pairs)

1-16

2-17

3-18

4-19

5-20

6-21

7-22

8-23

9-24

10-25

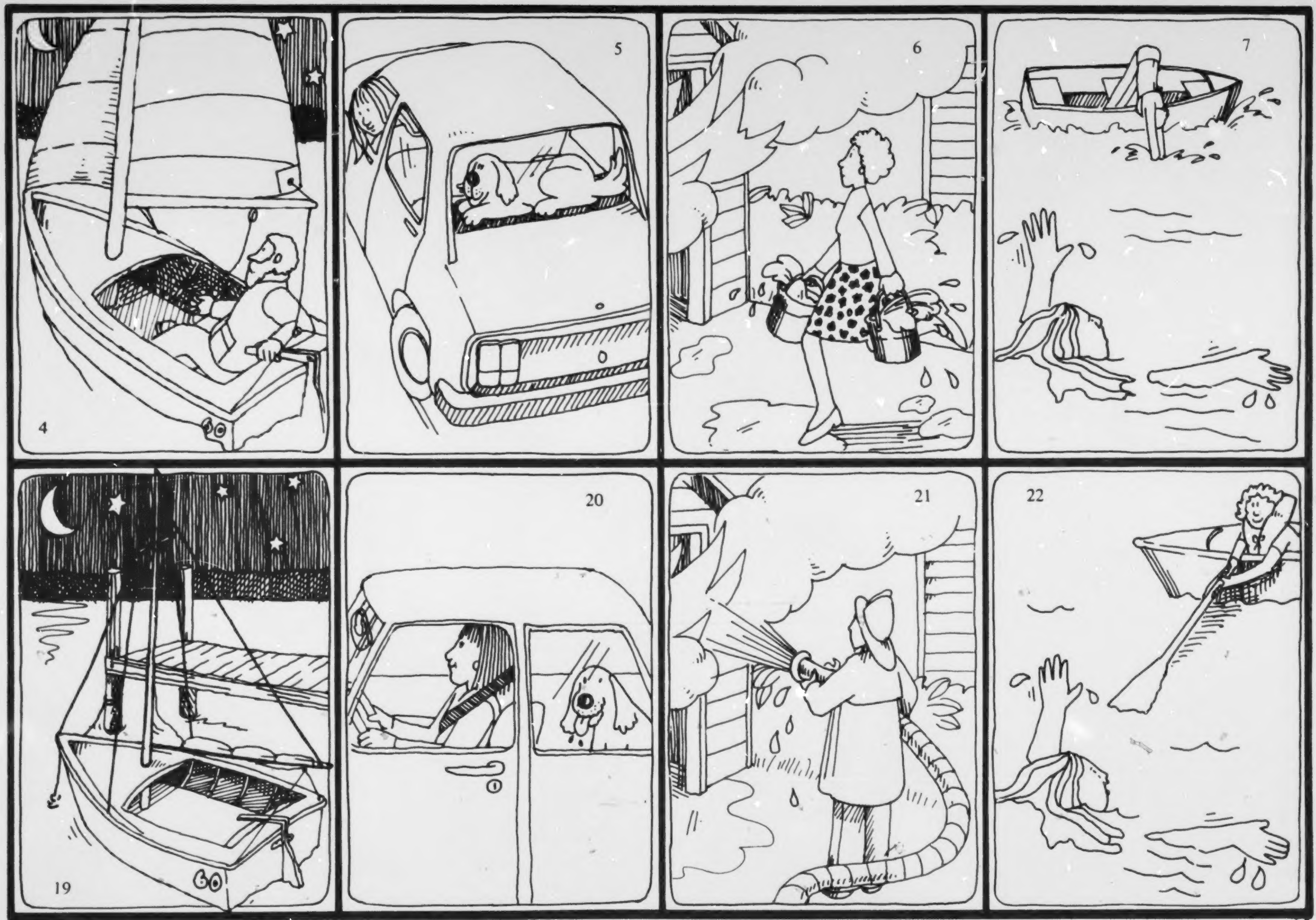
11-26

12-27

13-28

14-29

15-30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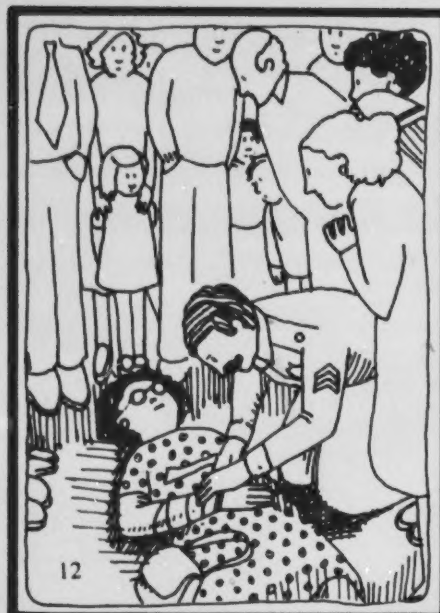
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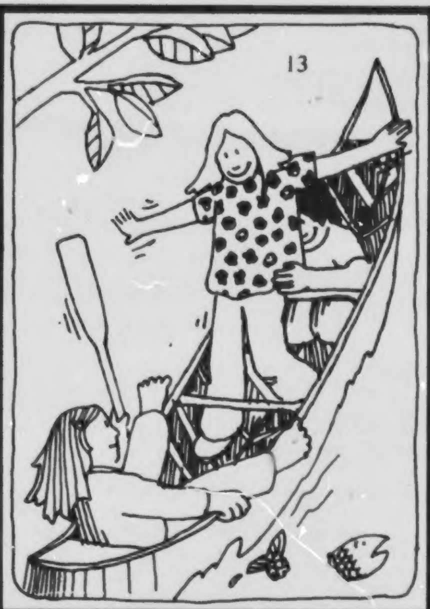
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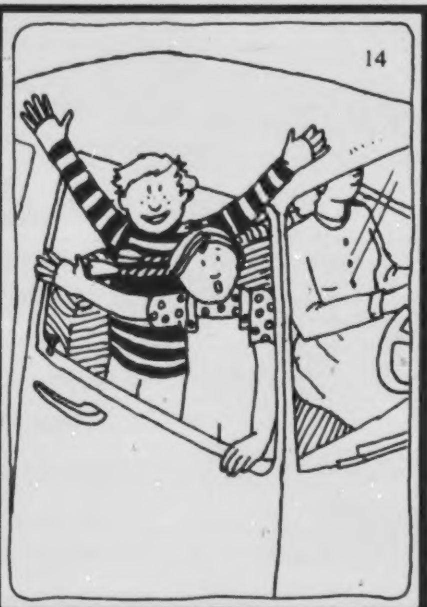
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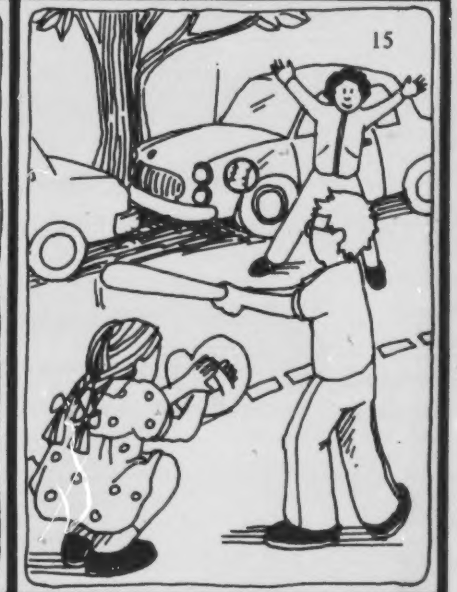
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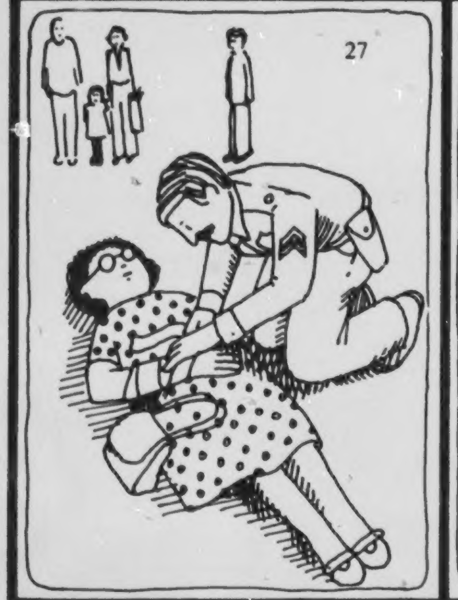
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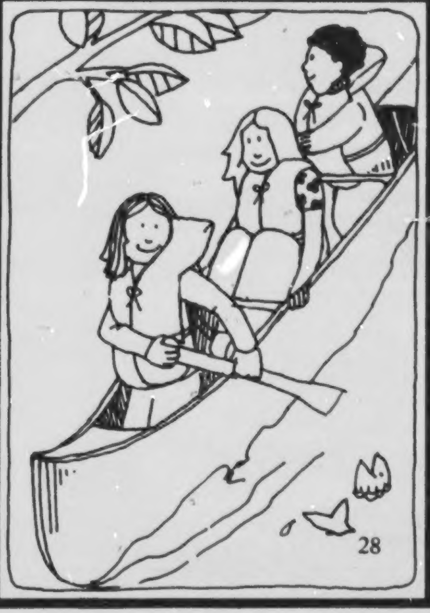
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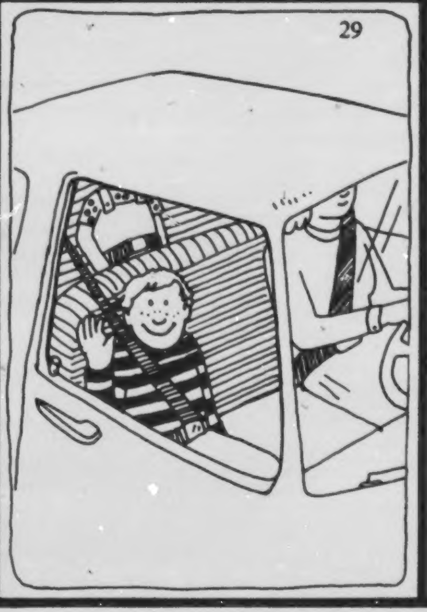
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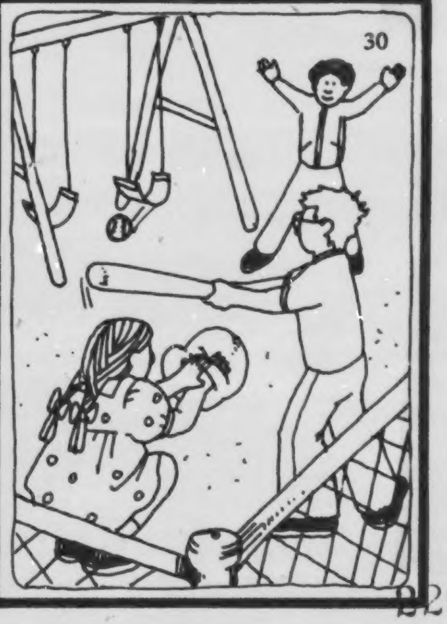
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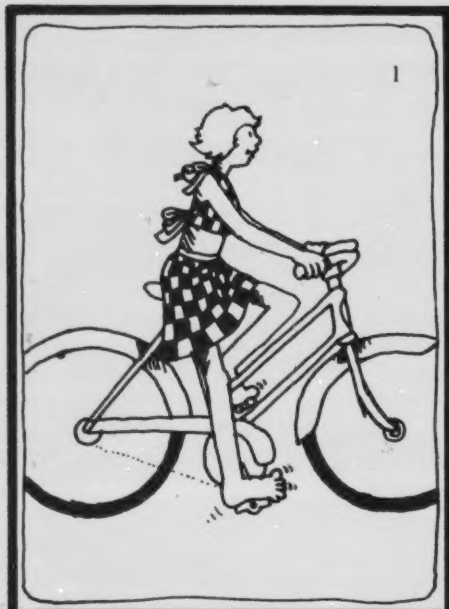
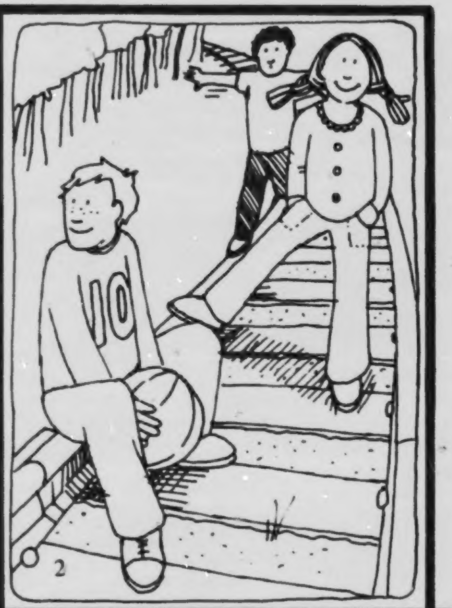
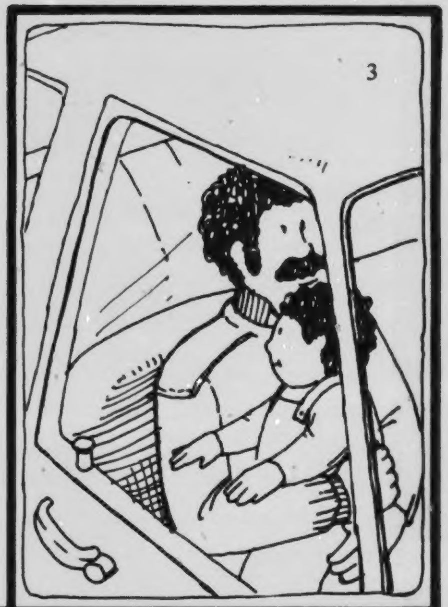
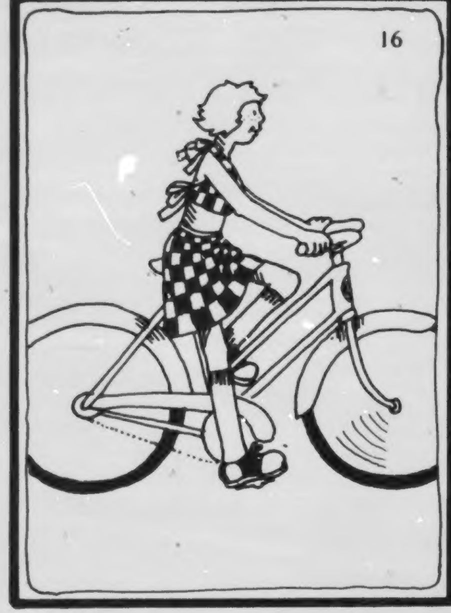
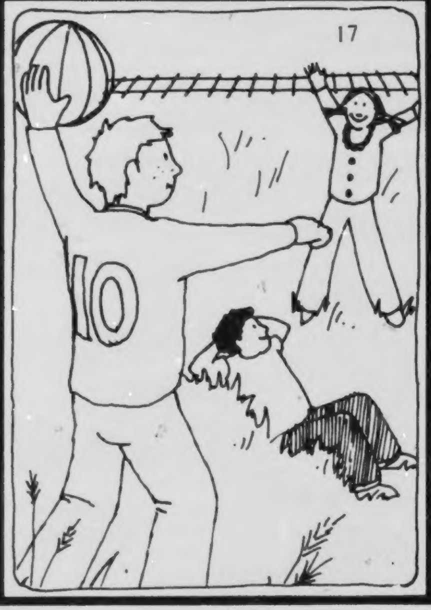


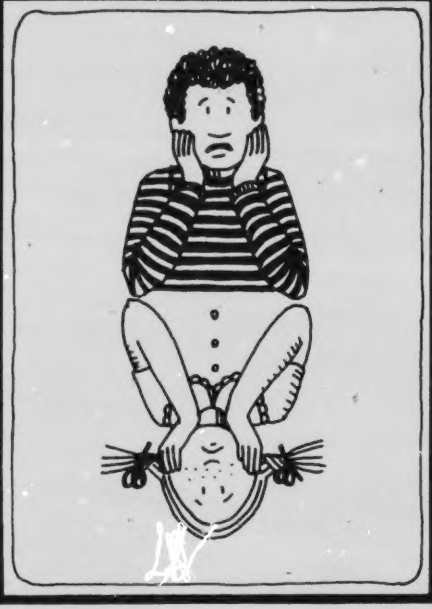


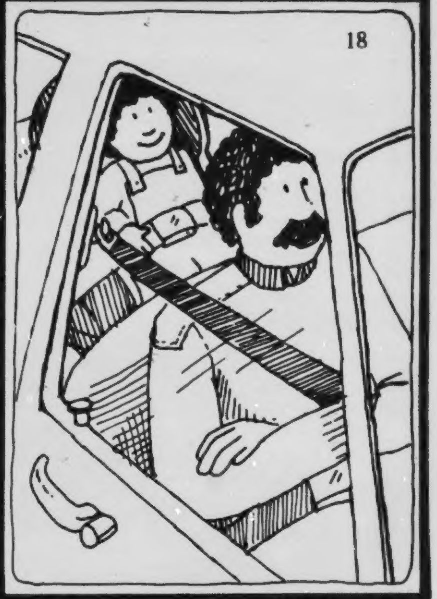
CUT ALONG
HEAVY LINES

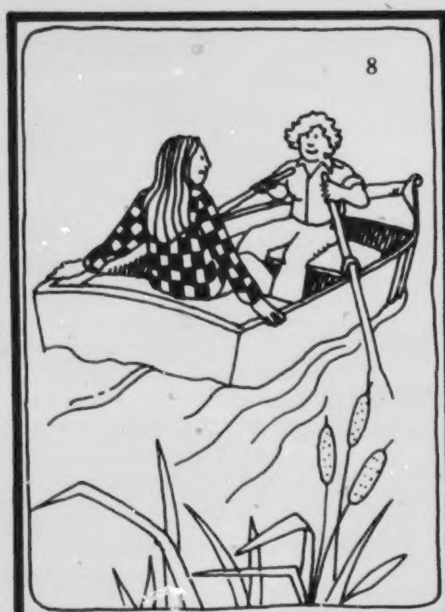












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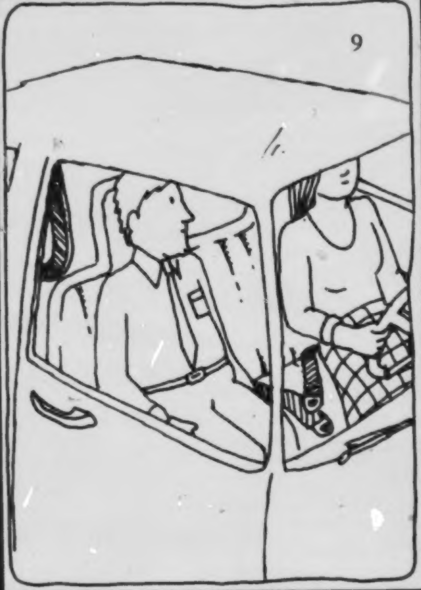

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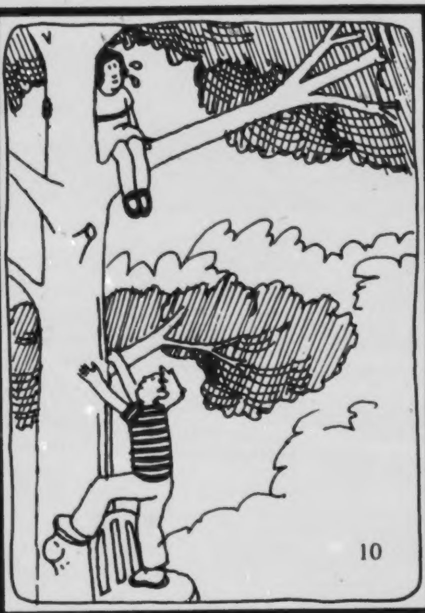

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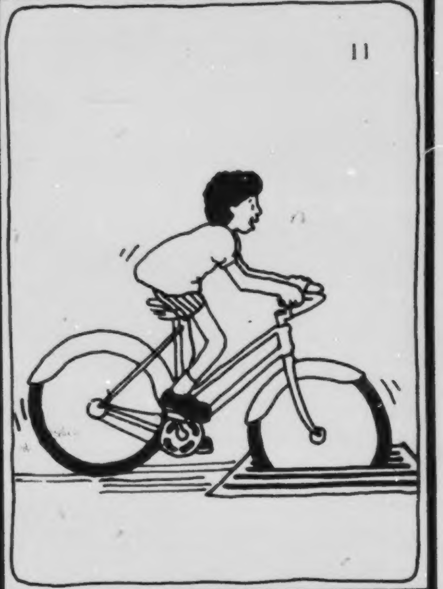

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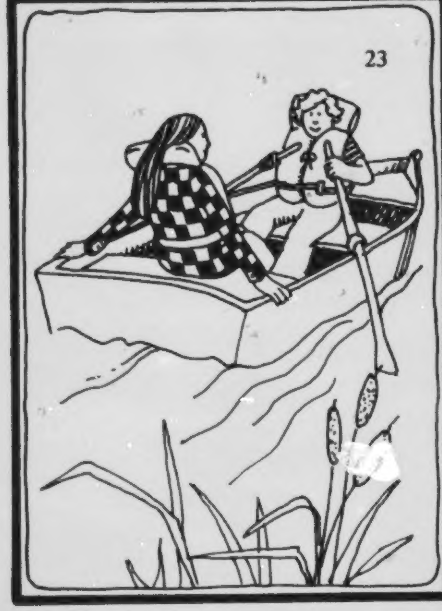

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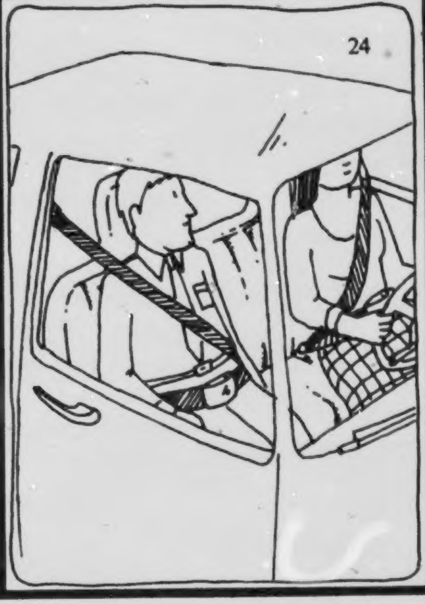

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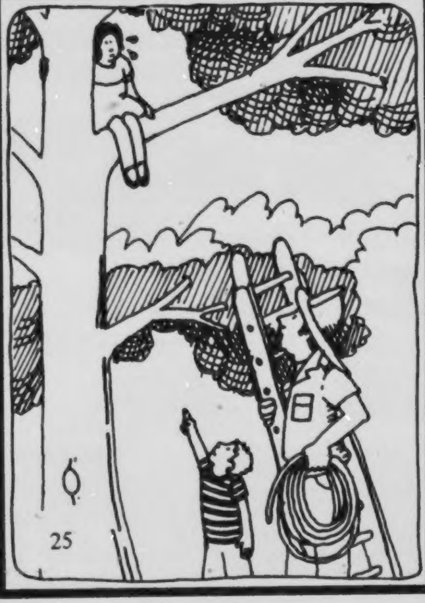

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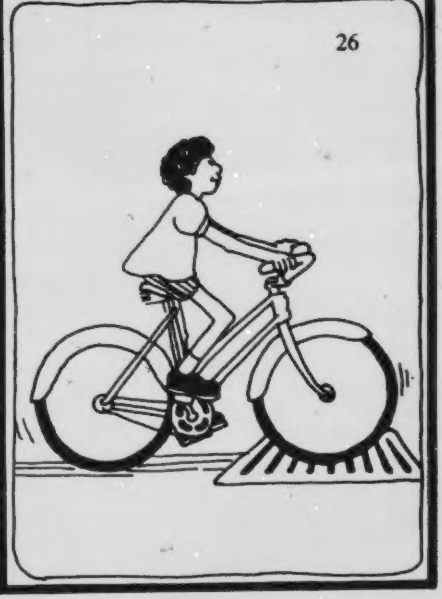


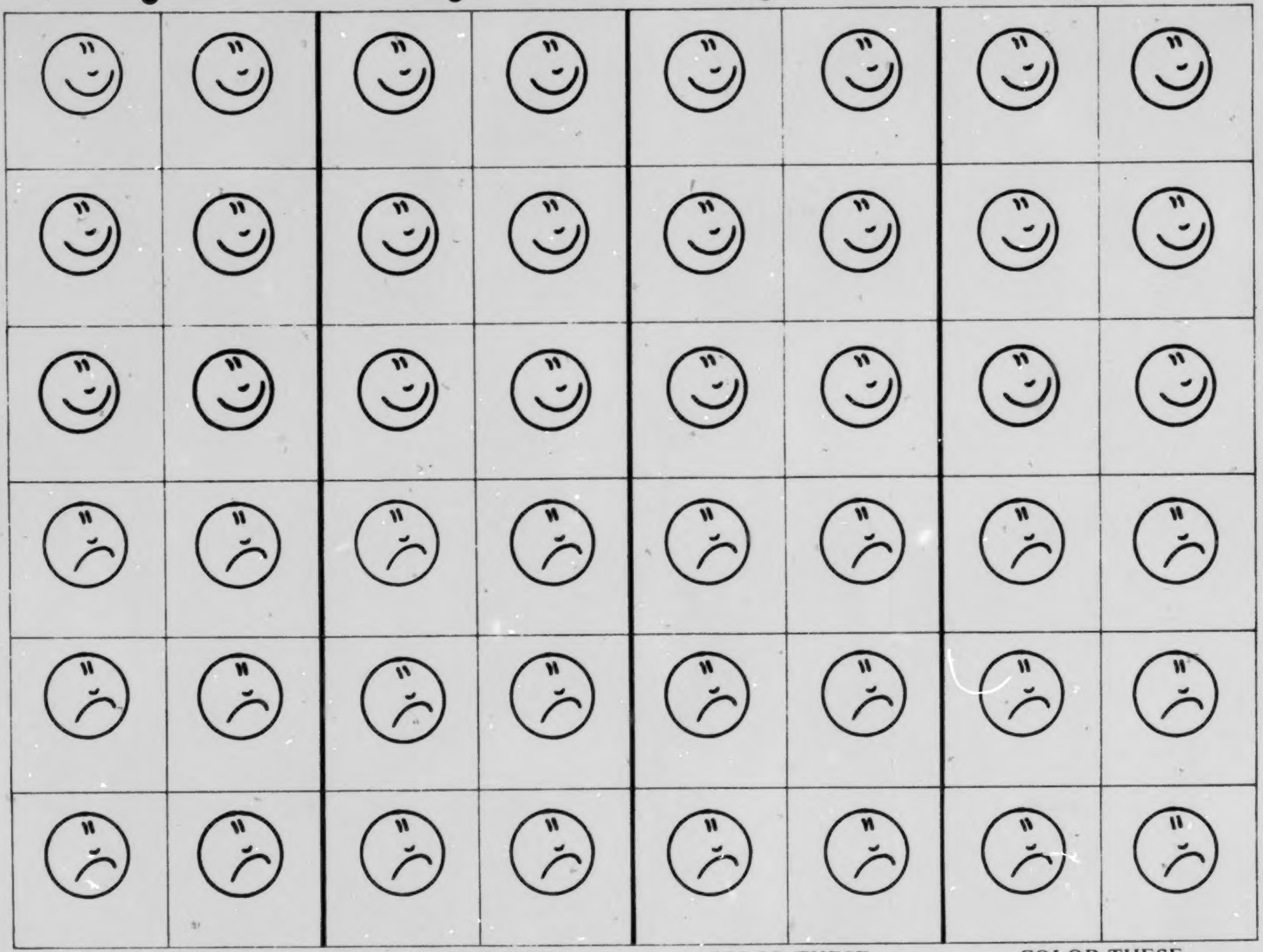
26

Board Game

Game Key (safe/unsafe boxes--game board boxes are numbered in the bottom right hand corner)

1. safe
2. unsafe
3. unsafe
4. unsafe
5. safe
6. safe
7. unsafe
8. unsafe
9. safe
10. safe
11. unsafe
12. safe
13. safe
14. unsafe
15. unsafe
16. unsafe
17. unsafe
18. unsafe
19. safe
20. safe
21. safe
22. safe
23. safe
24. unsafe
25. safe
26. unsafe
27. safe
28. unsafe

Player 1 Player 2 Player 3 Player 4



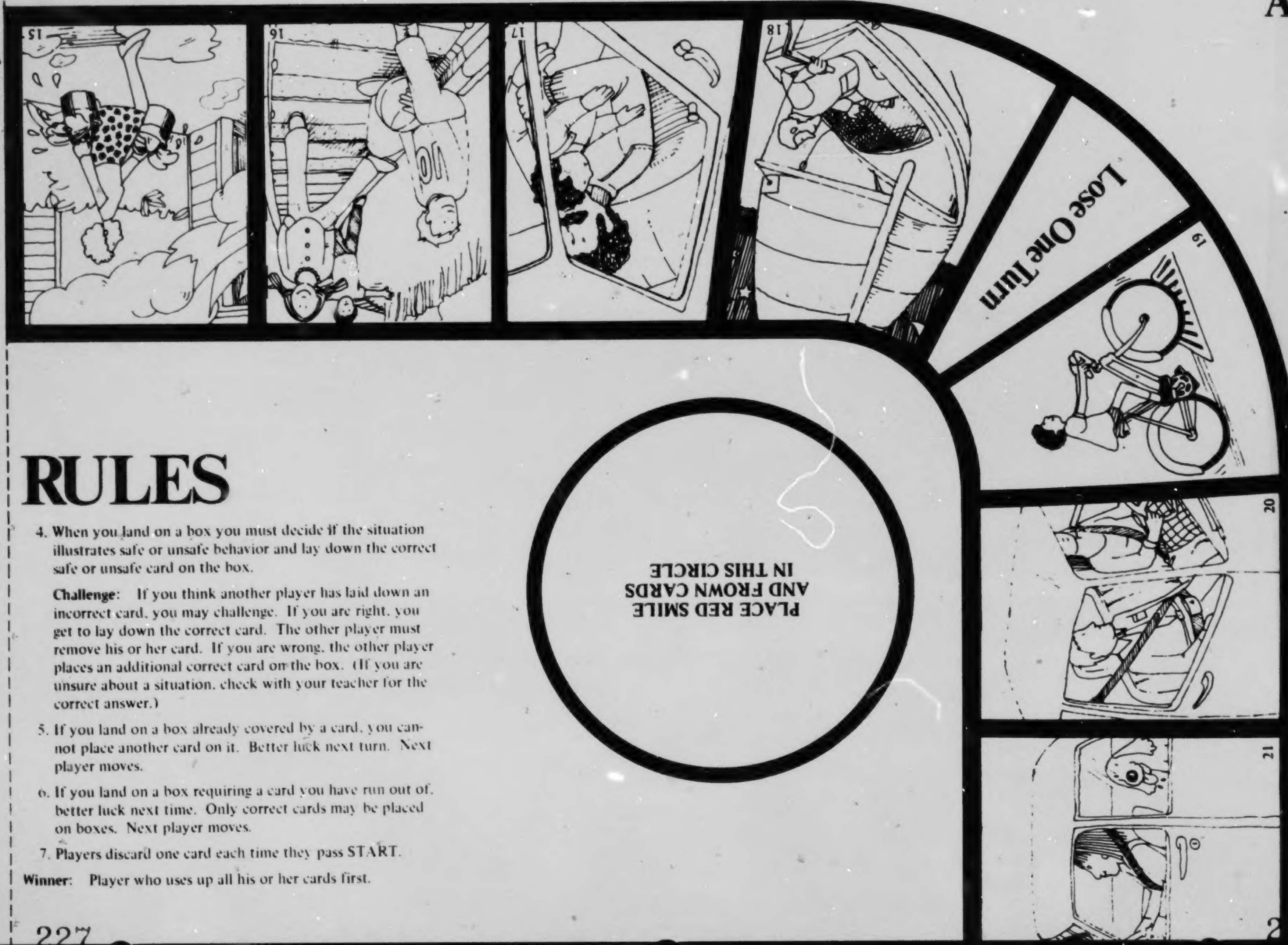
COLOR THESE FACES RED

COLOR THESE FACES YELLOW

COLOR THESE FACES BLUE

COLOR THESE FACES GREEN

Cut along dotted line



PLACE RED SMILE
AND FROWN CARDS
IN THIS CIRCLE

RULES

4. When you land on a box you must decide if the situation illustrates safe or unsafe behavior and lay down the correct safe or unsafe card on the box.

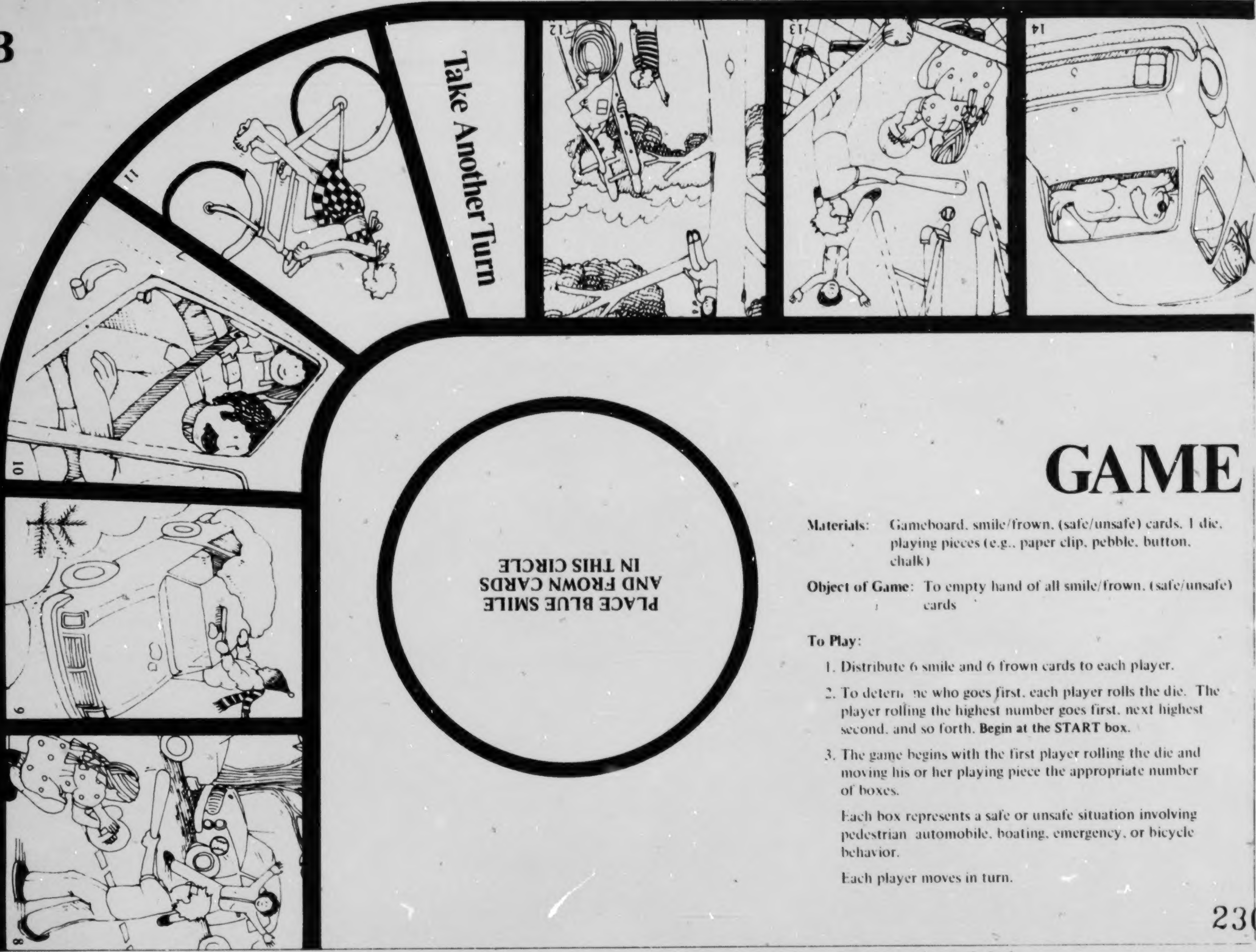
   Challenge: If you think another player has laid down an incorrect card, you may challenge. If you are right, you get to lay down the correct card. The other player must remove his or her card. If you are wrong, the other player places an additional correct card on the box. (If you are unsure about a situation, check with your teacher for the correct answer.)

5. If you land on a box already covered by a card, you cannot place another card on it. Better luck next turn. Next player moves.

6. If you land on a box requiring a card you have run out of, better luck next time. Only correct cards may be placed on boxes. Next player moves.

7. Players discard one card each time they pass START.

Winner: Player who uses up all his or her cards first.



GAME

Materials: Gameboard, smile/frown, (safe/unsafe) cards, 1 die, playing pieces (e.g., paper clip, pebble, button, chalk)

Object of Game: To empty hand of all smile/frown, (safe/unsafe) cards

To Play:

1. Distribute 6 smile and 6 frown cards to each player.
2. To determine who goes first, each player rolls the die. The player rolling the highest number goes first, next highest second, and so forth. **Begin at the START box.**
3. The game begins with the first player rolling the die and moving his or her playing piece the appropriate number of boxes.

   Each box represents a safe or unsafe situation involving pedestrian automobile, boating, emergency, or bicycle behavior.

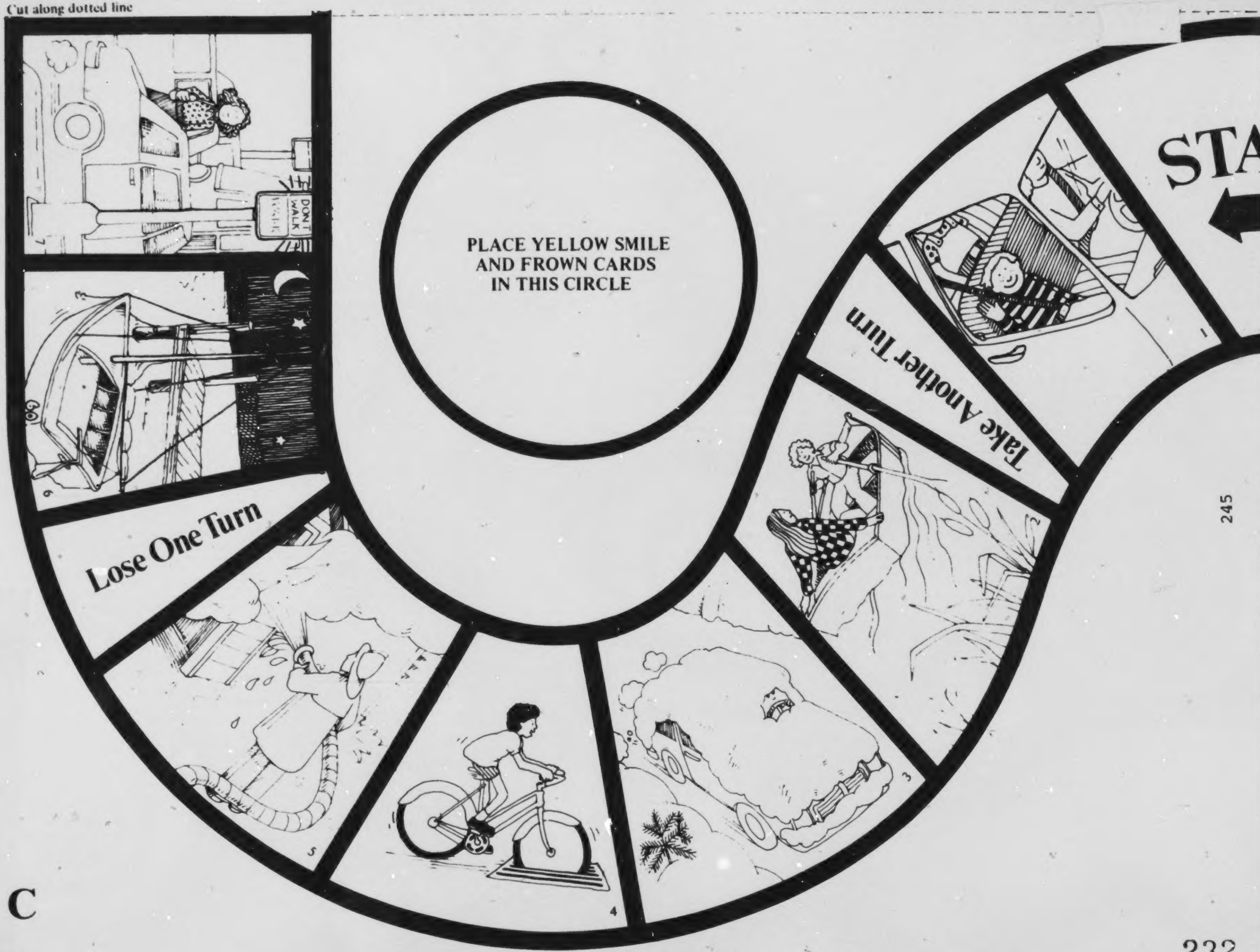
   Each player moves in turn.

Match this arrow with the arrow on page C

Line up the cut edge of page A with this solid line and tape the pages together on the back.

Line up the cut edge of page C with this solid line and tape the pages together on the back.

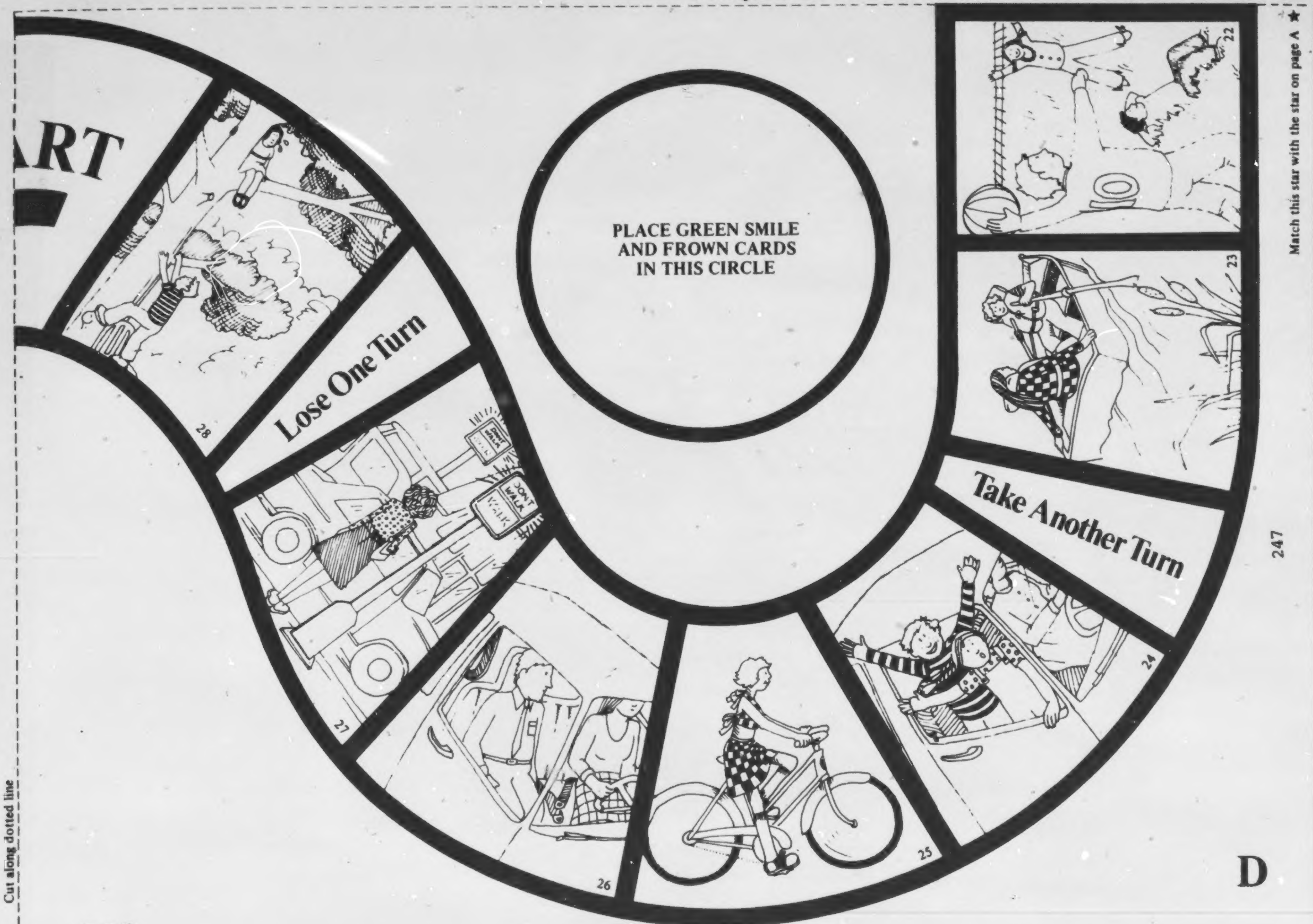
Cut along dotted line


STA
PLACE YELLOW SMILE
AND FROWN CARDS
IN THIS CIRCLE
1
Take Another Turn
2
3
4
5
Lose One Turn
6
DON'T WALK
WALK
7

C

Line up the cut edge of page D with this solid line and tape the pages together on the back.

Cut along dotted line


ART
22
23
PLACE GREEN SMILE
AND FROWN CARDS
IN THIS CIRCLE
28
Lose One Turn
DON'T WALK
WALK
27
26
25
24
Take Another Turn
D

Match this star with the star on page A ★

Cut along dotted line

SUPPLEMENTARY ACTIVITY

Activity #26 which follows suggests quiz questions you can use after teaching one or more of the mini-units or individual activities.

ACTIVITY #26

Supplementary Activity Approximate Class Time: ½-1 period

Capsule Activity Description: Students answer questions on transportation safety.

Objective:
To evaluate what students have learned during their study of transportation safety.

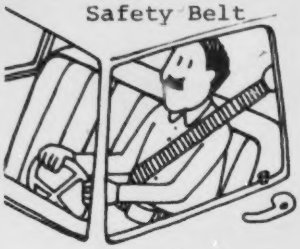
ACTIVITY

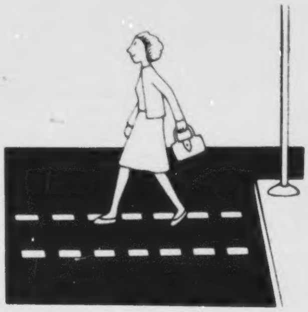
A series of questions on transportation safety follows. You will want to choose only those questions which treat aspects of transportation safety which your students have studied.

These quiz questions can be used to evaluate a mini-unit or to supplement the evaluation methods included in the objectives statement at the beginning of each activity.

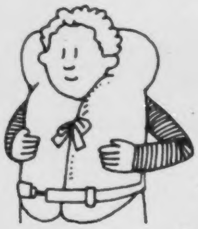
1. Draw a circle around the pictures of all the things that help us to stay safe.

Safety Belt



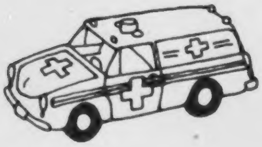


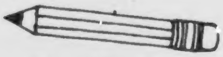
Crosswalk



Personal
Flotation
Device

Ambulance





Pencil

2. Fill in the blank with the right word.

words to use: Safety Belt
Look
Oar
Alone
Noise
Telephone

(a) When you cross the street you should _______ first.

(b) If there is a fire, use the __________ to call the fire department.

(c) If someone falls out of your boat, pull him in with an ______.

(d) When you make too much ______ in the car, Mother cannot drive safely.

(e) Everybody should wear a ________ _______ when riding in a car.

(f) Always go out in a boat with somebody else, never go out ________.

3. Make a happy face ☺ in the circle if what the person is doing is safe. Make a sad face ☹ if what he is doing is *not* safe.

(a) I always wear white when I walk at night. ○

(b) I can't swim, but I like to row boats. ○

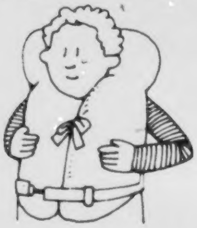
(c) I cross the street when the light says walk. ○

(d) I LOOK and LISTEN before I cross the street. ○

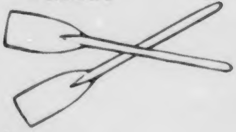
(e) We had a fire at our house. *First* I tried to put it out, *then* I called the fire department. ○

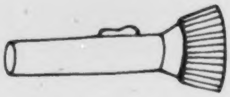
4. Circle the pictures of the things you should have in a boat.

Personal Flotation Device



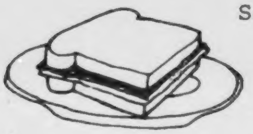
Paddle

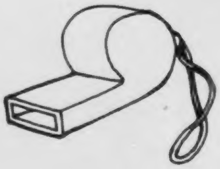




Flashlight

Sandwich





Whistle

5. Fill in the blank with the right word.

Words to use:	Helicopter	Ambulance
	Feet	Safety belt
	Fire engine	Boat

(a) I fly in the air. I spot fires and help people who are hurt. I am a ______________.

(b) I go very fast. When people are hurt or sick I take them to the hospital. I am an ____________.

(c) I float on the water. Many people think I am fun. Please know how to swim before you use me. I am a ______________.

(d) I am with you all the time. You use me every day. I take you places near and far. Sometimes I get tired. I am your __________.

(e) I am big and often I am red. When something is on fire I help put it out. Call me if you need me. I am a _______ _______.

(f) I sit in your lap and lie across your shoulder. I try to keep you safe in the car. I am a _______ _______.

Answers

1. Safety belt
   Ambulance
   Personal flotation device
   Crosswalk

2. (a) Look
   (b) Telephone
   (c) Oar
   (d) Noise
   (e) Safety belt
   (f) Alone

3. (a) ☺
   (b) ☹
   (c) ☺
   (d) ☺
   (e) ☹

4. Personal flotation device
   Paddle
   Whistle
   Flashlight

5. (a) Helicopter
   (b) Ambulance
   (c) Boat
   (d) Feet
   (e) Fire engine
   (f) Safety belt

BIBLIOGRAPHY

BIBLIOGRAPHY

The Bibliography contains educational materials for classroom use and for use by teachers in developing relevant units of study on transportation safety. It consists of selected

- Curriculum materials
- Background materials for teachers
- Materials for students
- Periodicals

The individual entries in the curriculum materials and student materials sections are presented in the following format:

**	*Title of Work,* author, date of publication. Number of pages or list of materials. Price.
Type of Material	Description of materials with evaluation of material's quality and relevance for transportation consumer education. Source from which material may be obtained.*

For purposes of convenience, the curriculum materials have been rated by the designation of stars next to the material description. (See sample above.) The stars represent the authors' evaluation based on the following scale:

No stars:	material is useful, but fair
(*) One star:	material is good
(**) Two stars	material is very good
(***) Three stars:	material is excellent

It should be kept in mind that these evaluations are an estimation of the material's *quality and relevance.*** As such, the absence of a teaching material or a low rating does not per se indicate the material is poor. It may be excellent but simply not relevant to the Manual's content. In addition, any absences may be due to the authors' oversight.

At the end of the Manual is a list of government agencies which can be contacted for further information about transportation safety.

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*Allow ten weeks for delivery of items ordered from the U.S. Government Printing Office.

**A complete discussion of the criteria used to evaluate the materials may be found on pages 448 and 449.

Curriculum Materials

Automobile Safety

* *Safety Instructional System* (no date). 285 pages. $2.00.

Guide Excellent guide that covers pedestrian, school bus, bicycle, auto passenger, and school environment pedestrian safety. Activities are plentiful, creative, and detailed. Bibliography is complete. Well illustrated. Guide does fail to discuss or include activities on affective safety issues such as peer pressure, rebellion, search for "kicks," and "it-won't-happen-to-me" thinking.

Maryland State Department of Education
P.O. Box 8717
Friendship International Airport
Baltimore, Maryland

Teaching Children About Safety Belts, 1973. 32 pages. 40¢.

Guide Manual of K-4 level activities designed to encourage students to use and to get their parents to use seat belts. Useful for elementary teachers. Has some creative activities. Provided with the booklet is a simple board game called SAFETY BELT GAME that is fun but may not motivate students to use seat belts.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

The New Look in Traffic Signs and Marking. 1972.

Pamphlet Sprightly, multi-colored pamphlet describing motor vehicle, pedestrian, bicyclist, etc. signs, signals, and pavement markings. Profusely illustrated.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock Number 5001-0027

* *Teaching Children About Safety Belts,* 1973. 1 page. 40¢.

Bibliography

Curriculum guide on safety belt education for K-3 with one page describing three relevant films for children.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Traffic Safety Education Films (no date). 2 pages. Free.

Catalogue

Annotated list of films on traffic safety, from freeway driving to alcohol-traffic safety.

Contact nearest American Automobile Association (AAA) office
or
AAA Foundation for Traffic Safety
1712 G Street, N.W.
Washington, D.C. 20006

*** *Automobile Safety Belt Activities Book,* 1973. 13 pages. 25¢.

Guide

Detailed suggestions for classroom activities on seat belt use, such as crossword puzzles, poems, short story writing, and surveys.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Pedestrian Safety

*** *Safety Instructional System* (no date). 285 pages. $2.00.

Guide

Excellent guide that covers pedestrian, school bus, bicycle, auto passenger, and school environment pedestrian safety. Activities are plentiful, creative, and detailed. Bibliography is complete. Well illustrated. Guide does fail to discuss or include activities on affective safety issues such as peer pressure and "it-won't-happen-to-me" thinking.

Maryland State Department of Education
P.O. Box 8717
Friendship International Airport
Baltimore, Maryland

* *Traffic and Pedestrian Education Systems*, 1973. 37-page Leader's Guide, 23 spirit masters, fifteen cassette tapes, fifteen filmstrips. $86.00.

Module Comprehensive multimedia unit covering all aspects of pedestrian safety for youngsters, including crossing streets, selecting safe routes to school, care with railroad tracks, and the meaning of signs. Behavior in cars and bicycle riding are also covered. Unit consists of fifteen modules. For each module the following are provided: audio-tape geared to filmstrip; "immediate reinforcement activities" consisting of suggested activities such as songs and children's games; discussion topics; 1-2 activity masters--activities consist of coloring exercises; and supplemental reinforcement activities such as reading poems, making wall murals, creating trains out of cartons, role plays, and children's games. Activities are creative but not always detailed. Sheet music for nine songs is provided. Tapes have music, singing and dialogue. General approach is injunctive and cognitive, but many activities present the opportunity for more open-ended and affectively oriented classroom experiences. Filmstrip and spirit masters use ethnic minorities but are very middle class.

Elisar Research Corporation
15 East 48th Street
New York, New York

Background Materials for Teachers

Automobile Safety

Amrine, Michael. *The Safe Driving Handbook.* (Grosset and Dunlap, New York: 1970).

Burby, John. *The Great American Motor Sickness.* (Little, Brown and Company, Boston: 1971).

Fales, Edward P. *Belts On, Buttons Down; What Every Mother Should Know About Car Safety.* (Delaconte Press, New York: 1971).

Nader, Ralph. *Unsafe at Any Speed.* (Bantam Books, New York: 1972; revised, 1973).

Emergency Vehicles

Keller, Hartmut. *An Analysis of Freeway Emergency Service Systems.* (National Technical Information Service, Springfield, Virginia: 1969; Catalogue #AD 695-378).

Boats and Recreational Vehicles

Andrews, Howard L., and Dr. Alexander L. Russel. *Basic Boating: Piloting and Seamanship.* (Prentice Hall, Englewood Cliffs, New Jersey: 1974).

BUC International Corporation, *BUC's 1976 New Boat Directory.* (Ft. Lauderdale, Florida: 1976).

Malo, John, W., *Snowmobiling: The Guide.* (MacMillan, New York: 1972).

Malo, John. *All Terrain Adventure Vehicles.* (MacMillan, New York: 1972).

Thomas, James Lee. *Safe Snowmobiling: Fun Without Damage.* (Sterling Publishing Co., New York: 1971).

Tuite, James J. *Snowmobiles and Snowmobiling.* (Tower, New York: 1971).

U.S. Department of Interior. *Offroad Recreation Vehicles.* (U.S. Government Printing Office, Washington, D.C.: 1972).

Wallace, Clark. *The Complete Snowmobile.* (Scribner, New York: 1971).

Wimer, Sally. *The Snowmobiler's Companion.* (Scribner, New York: 1973).

Materials for Students

If I Drove a Car, Miriam Young, 1971. 31 pages.

Book Fiction. A young child tries to decide what kind of automobile he would like to drive when he is older.

Lothrop, Lee and Shepard Co.
New York, New York

Train Ride, John Steptoe. 26 pages.

Book Fiction, Charles and his friends take a train to Times Square, then discover they have no train fare home.

Charlie and the Great Glass Elevator, Ronald Dahl, 1972.

Book Fiction. Dahl relates the adventures Charlie encounters with the glass elevator. Easy reading.

Alfred A. Knopf, Inc.
New York, New York

Jetport, Norman Richards, 1973. 96 pages.

Book Jetport explains to young readers, in words and pictures, how an airport moves hundreds of airplanes and thousands of passengers safely and efficiently.

Doubleday and Co., Inc.
Garden City, New York

Periodicals

Periodicals can be a rich source of information on transportation safety. Even general consumer periodicals, like *Consumer Reports* and *Changing Times,* contain in many issues an article on transportation safety. Unfortunately, it was not feasible to include a definitive list of all relevant periodicals. For example, there are over two dozen on motorcycles alone. It was also impossible to provide here a list of relevant articles that have appeared in the recent past in periodicals. Moreover, the subscriber or reader cannot know in advance when a periodical will print an article that will interest him. Despite these drawbacks, many teachers will find it useful to subscribe to or read library copies of periodicals in the expectation that they will discover articles or references to additional materials of immediate relevance to their teaching or research efforts. The more specifically a periodical is related to his particular interest, of course, the more likely is the reader to find relevant materials. Teachers can also consult in libraries the *Reader's Guide to Periodical Literature* for past articles about transportation.

American Motorcycle Association News
5655 North High Street
Worthington, Ohio 43085

Changing Times
The Kiplinger Magazine
Editors Park, Maryland 20782

Coast Guard Boating Safety Newsletter
Department of Transportation
Office of Boating Safety
400 Seventh Street, S.W.
Washington, D.C. 20590

Consumer Educator
National Association of Secondary
School Principals
2101 Sixteenth Street, N.W.
Washington, D.C. 20036

Consumer News
Federal Office of Consumer Affairs
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Consumer Reports
Consumer's Union
236 Washington Street
Mt. Vernon, New York 10550

Mini-Bike Guide
P.O. Box 1380
Huntington Beach, California

Motor Trend Magazine
8490 Sunset Blvd.
Los Angeles, California 90069

Newsletter of the American
Council on Consumer Interests
238 Stanley Hall
University of Missouri
Columbia, Missouri 65201

Of Consuming Interest
Federal State Reports
P.O. Box 986
Arlington, Virginia 22216

Road and Track Magazine
P.O. Box 2324
FDR Post Office
New York, New York 10022

Skylights
National Aerospace Education
Council
Suite 310
806 Fifteenth Street, N.W.
Washington, D.C. 20006

Sno Goer
1999 Shepard Road
St. Paul, Minnesota 55116

Traffic Safety
The National Safety Council
425 North Michigan Avenue
Chicago, Illinois 60611

Transpo Topics for Consumers
Department of Transportation
Office of the Secretary
Washington, D.C. 20590

PUBLIC TRANSPORTATION

WHY TEACH ABOUT PUBLIC TRANSPORTATION

The Problems

American consumers are the purchasers and users of nearly 124 billion dollars per year worth of personal transportation goods and services.

The mobility and convenience of the automobile have created an enormous imbalance in our transportation modes and a neglect of public transportation. Patronage of public transportation services (buses, trolleys, subways, and trains) declined from 23 billion dollars in 1946 to 6.95 billion in 1975--a decrease of 67 percent. The number of motor vehicles increased from 31 million in 1945 to 133.7 million in 1975, an increase of over 300 percent. Of the 133.7 million vehicles in 1975, 107.3 million were passenger cars.

A shift in emphasis from automobiles to public transportation is essential to provide a means of transportation for the one in five families living in cities and one in four families living in small towns who do not own a car; the people who do own cars but who are on countless occasions unable to use them due to personal incapacitation, loss of license, loan of the car, car repairs; and the elderly and the permanently handicapped who cannot drive.

The use of public transportation will help eliminate massive traffic congestion. At this time 77 percent of the nation's workforce commutes to work every day by private automobile; 70 percent of these people drive alone. Thirty-two urban areas account for 37 percent of all motor vehicles, contributing to heavy traffic congestion.

Public transportation will help reduce auto-related accident fatalitites. More people have been killed on our nation's highways than the total number of Americans killed in wars fought by this country. Public transportation will also reduce the energy consumption of motor vehicles by 25 percent. Eighteen percent of the nation's energy is consumed by motor vehicle transportation. Nearly 80 percent of this amount is for personal travel by car, truck, or bus. While Americans reduced their vehicle fuel consumption in 1974 and 1975 as a result of the immediate fuel crisis, early 1976 patterns indicate an increase in vehicle fuel consumption.

The Solutions

Federal and state governments must promote balanced transportation by providing assistance for planning, development, and financing of improved transportation systems; and enact legislation which would be of assistance to the public transportation area.

Local transit authorities could generate greater use of their services by making public transportation more accessible and attractive to the daily traveler; and find solutions to their severe financial problems.

Citizens/consumers should become informed of local transportation problems and participate in their remedies and take advantage of available public transportation services.

Teachers must guide students to a better understanding of the causes and effects of transportation problems, and of possible solutions. Transportation consumer education can offer students a unique opportunity to develop awareness and skills essential to acquire responsible transportation habits and to play a role in supporting and improving transportation in the community.

This Chapter focuses on teaching public transportation by developing consumer skills that are particularly important to students in Grades K-3. The learning activities are designed to:

- Introduce students to various modes of transportation
- Stimulate students' awareness and understanding of public transportation
- Teach students to use public transportation
- Promote the safe and responsible use of public transportation
- Guide students toward recognizing community needs for public transportation

PUBLIC TRANSPORTATION

Activity #	Activity Description	Class Time (periods)*
	Mini-unit 9 **Discovering modes of public transportation**	
27	Students make a list of the many ways to travel.	1
28	Students respond to pictures of various modes of transportation.	½-1
29	Students make large wall hangings of public transportation vehicles.	2-4
30	Students listen to a story about a town's transportation problems.	1½-2
	Mini-unit 10 **Learning to make transportation decisions**	
31	Students make a list of the many ways to travel.	1
32	Students assess their travel needs and their use of and ability to use public transportation.	2½-4
33	Students take a ride on a public transportation vehicle.	2-3
34	Students review transportation modes by making collages and mobiles then discuss community transportation and a common transportation problem.	2-2½
	Mini-unit 11 **Using public transportation safely**	
35	Students describe emergencies they have experienced involving personal safety and relate these emergencies to travel emergencies on public transportation vehicles.	1
36	Students perform skits demonstrating the procedures for proper and safe behavior while using public transportation.	1-2
	Supplementary Activity	
37	Students answer questions on public transportation.	½-1

*Assumes class period of 30-40 minutes.

MINI-UNITS
AND
LEARNING ACTIVITIES

MINI-UNIT 9

DISCOVERING MODES OF PUBLIC TRANSPORTATION

This mini-unit is basic to understanding the concept of transportation and the many ways there are to travel. With most students at the K-3 level, it will not be possible at first to narrow your definition of transportation to public transportation. It is more important at this stage for students to recognize the many forms of transportation and to understand why there is a need for them.

Therefore this unit concentrates on introducing students to various types of transportation, with an emphasis on public transportation vehicles.

This mini-unit can be integrated into a study of the community and ways people travel, or it can be included as part of a larger unit on transportation. At the same time that the mini-unit is developing social studies skills, it will also reinforce several language arts skills; including list making, categorizing, association, and listening.

Note: Activity #27 in this unit is also used in Mini-unit 10 as Activity #31 because it is especially helpful in introducing the concept of transportation. If, however, you follow Mini-unit 9 with Mini-unit 10, you should not need to repeat this introductory activity.

MINI-UNIT 9 LESSON PLAN

Discovering modes of public transportation

Activity #	*Activities*	*Class Time*
27[a] Spirit Masters #8 & #9	DESCRIPTION: Students make a list of the many ways to travel.[a] OBJECTIVE: To demonstrate awareness of the field of transportation, students will be able to recognize and name at least 10 modes of transportation by the end of the activity.	1 period
28	DESCRIPTION: Students respond to pictures of various modes of transportation. OBJECTIVE: To show increased familiarity with the many modes of transportation by the end of the activity, students will be able to orally describe how at least one mode of transportation is used and by whom.	½-1 period
29	DESCRIPTION: Students make large wall hangings of public transportation vehicles. OBJECTIVE: By becoming aware of how different modes of transportation meet different needs, students will be able to describe orally the type of service provided by each mode of transportation dealt with in the activity.	2-4 periods
30	DESCRIPTION: Students listen to a story about a town's transportation problems. OBJECTIVE: By designing and drawing a public transportation system for a given community, students demonstrate their awareness of public transportation vehicles and how they are used by people with different needs.	1½-2 periods

Total Class Time: 5-8 periods.

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[a] This activity also appears in Mini-unit 10.

ACTIVITY # 27

Mini-unit Topic: Discovering Modes of Public Transportation

Approximate Class Time: 1 period

Capsule Activity Description: Students make a list of the many ways to travel.*

Objective:

To demonstrate awareness of the field of transportation, students will be able to recognize and name at least 10 modes of transportation by the end of the activity.

Concept Treated:

- There are many different ways for people to travel.

Materials Needed:

Pictures of transportation vehicles, flash cards.

ACTIVITY

Ask students to think of all the ways that people and goods travel. As the students call out the different modes, list them on the chalkboard. You can compile one master list or several smaller lists by categories as follows:

- Vehicles that travel on land
- Vehicles that travel on water
- Vehicles that travel in the air

You might also show the class pictures of the vehicles as they are mentioned, or, when the list is complete, reinforce the modes by asking several students to match the pictures of the vehicles with their appropriate names as written on the chalkboard. (Several pictures of public transportation vehicles have been included at the end of this activity. You may also find the glossary at the end of this chapter helpful for this discussion.)

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*This activity also appears in Mini-unit 10.

Next divide the class into two teams. Place the pictures of the transportation modes around the room so that students can easily see them. Using flash cards with the names of the modes written on them, students play a game matching names to pictures.

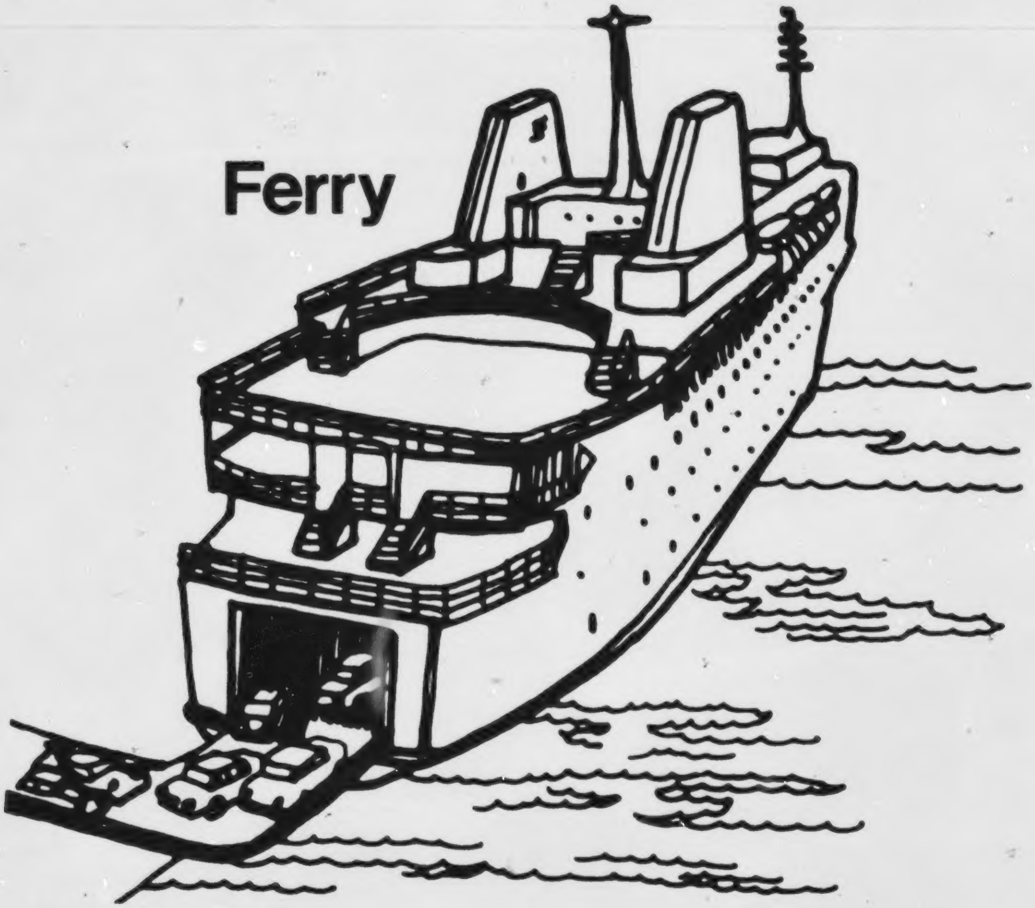
- The first student on Team A steps forward.
- Hold up a flash card.
- The student must say the word(s) on the card, then match the card to the picture by placing it in front of the illustration.
- If the student is correct, he or she returns the card to you and goes to the end of the line.
- If the student is incorrect, he or she takes his or her seat and the next student on that team takes a turn answering that same flash card.
- Once one team's members have all taken their seats because of missed matches, the other team is declared the winner. Or, the team left with the most players still standing at the end of the time allotted for the game wins.

As a project to be done in their spare time or as homework throughout the unit, each student compiles a travel scrapbook. This scrapbook contains all the ways there are to travel. Pictures can be cut from old magazines, or can be drawn and colored by hand. Students can start their books by coloring in the public transportation vehicles that appear on Spirit Masters #8 and #9.

Variation or Supplementary Activity:

Students can draw a neighborhood they are familiar with in their town or city and indicate on the drawings all the ways people travel in their community.

Ferry



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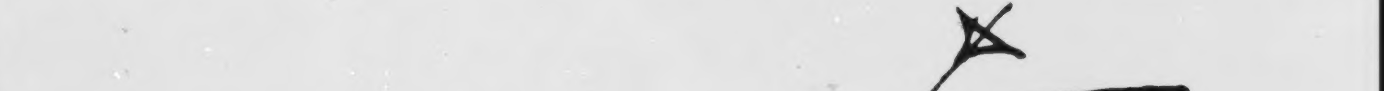
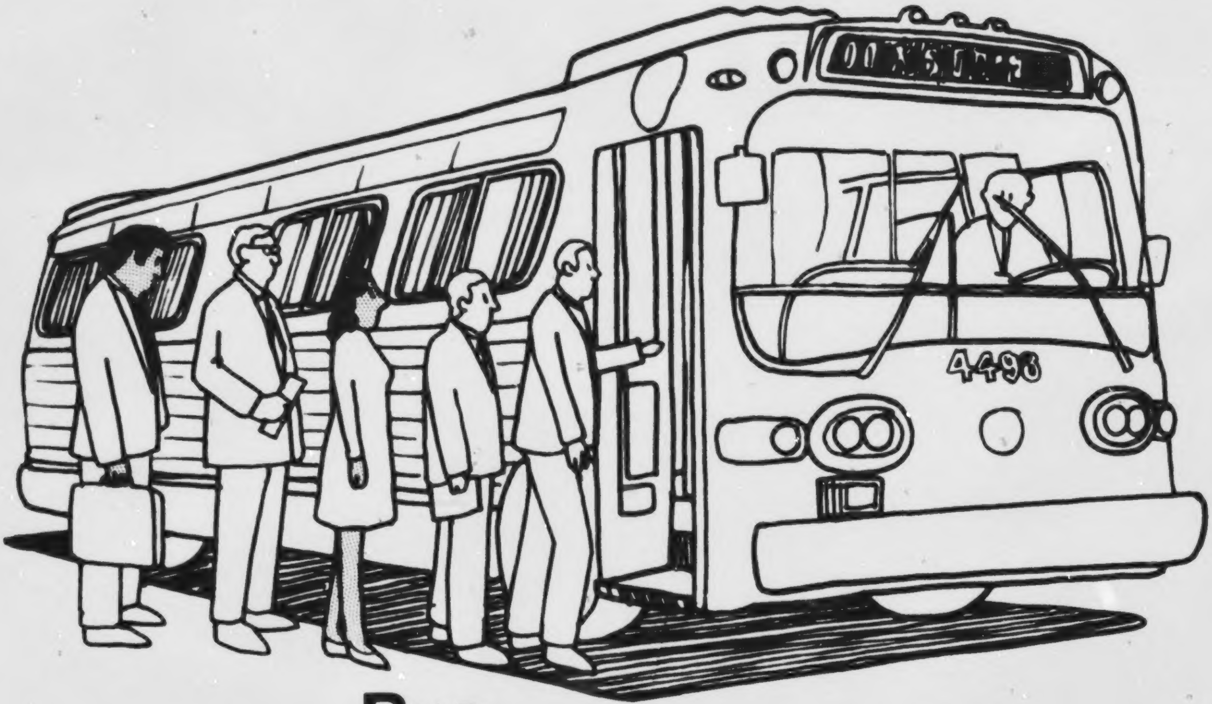
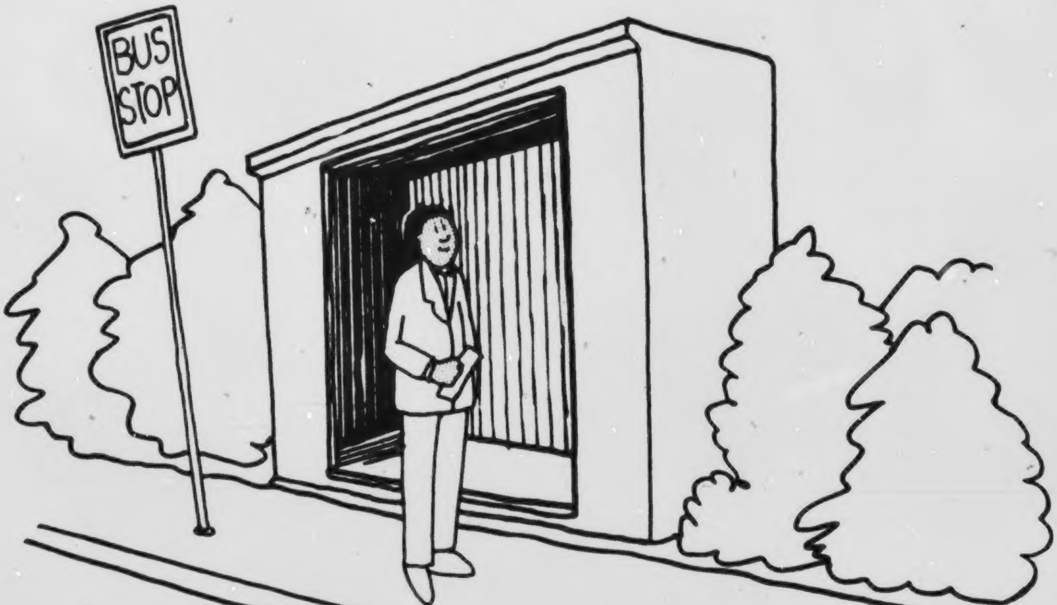


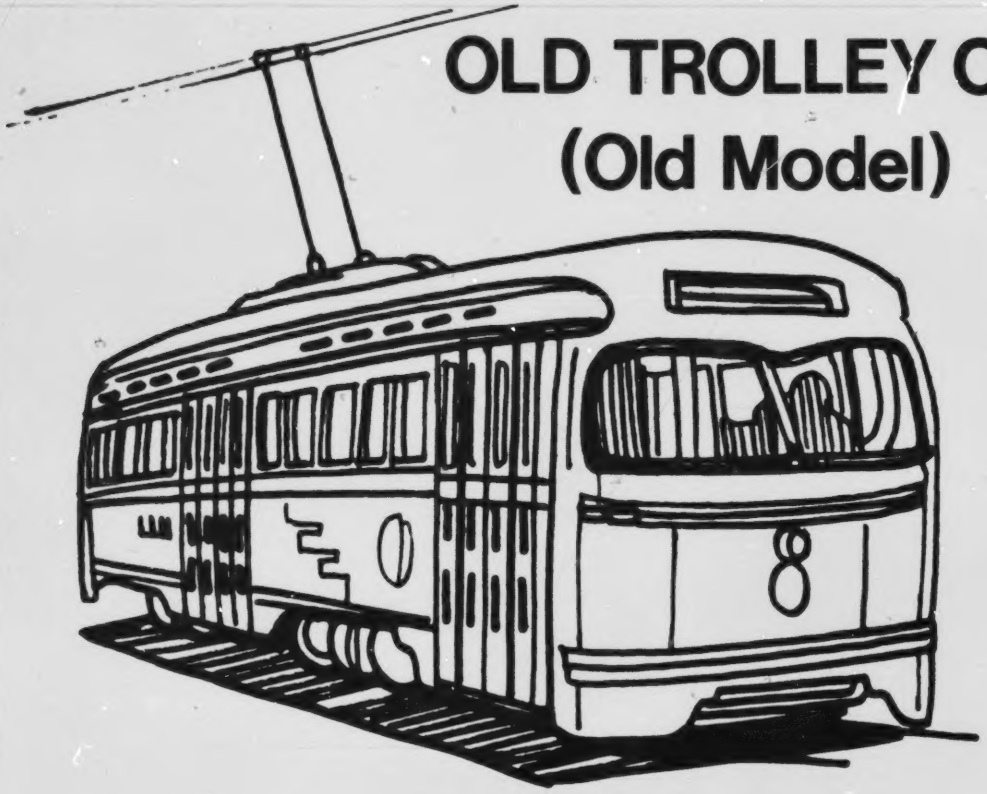


Bus

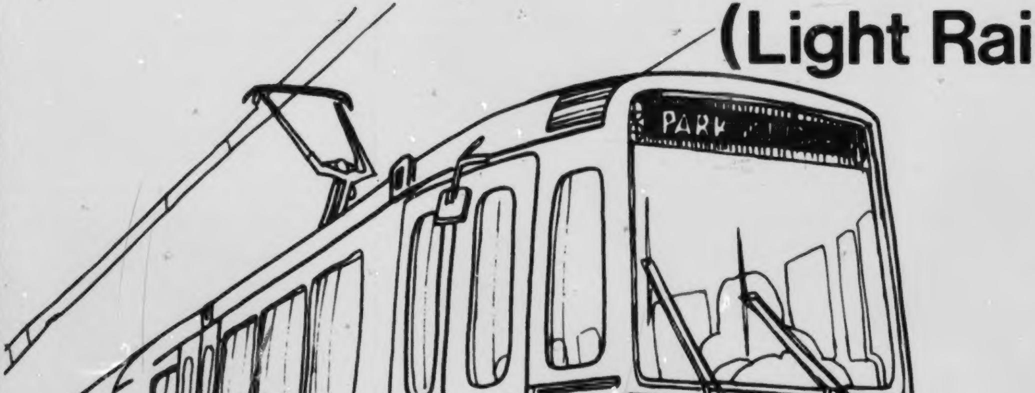


Bus Shelter

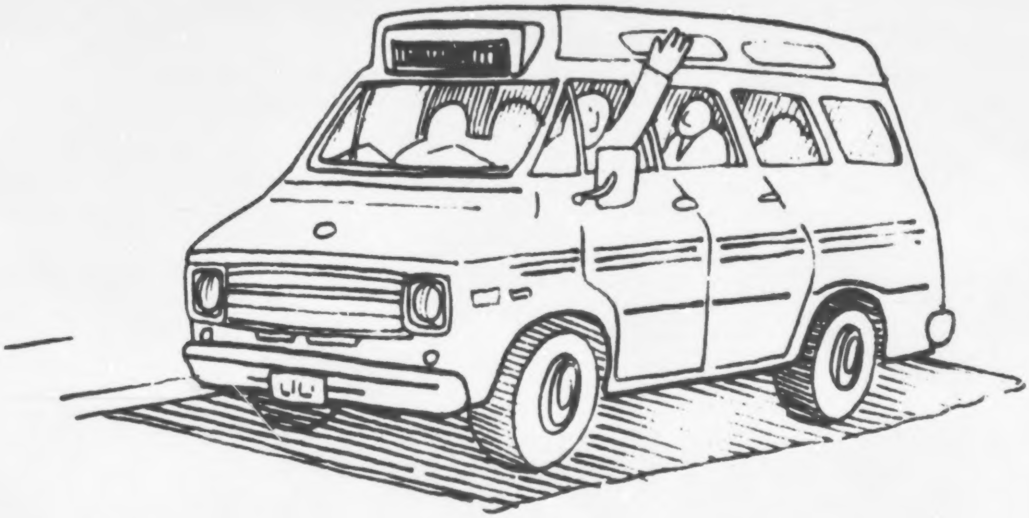
OLD TROLLEY CAR
(Old Model)

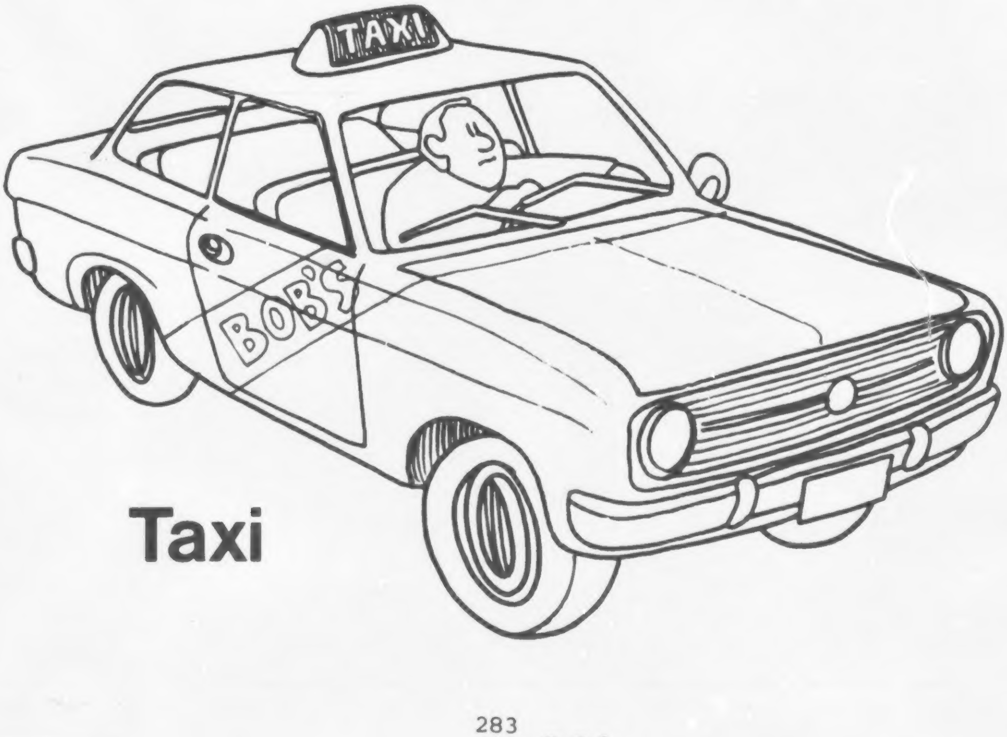


NEW TROLLEY CAR
(Light Rail Car)



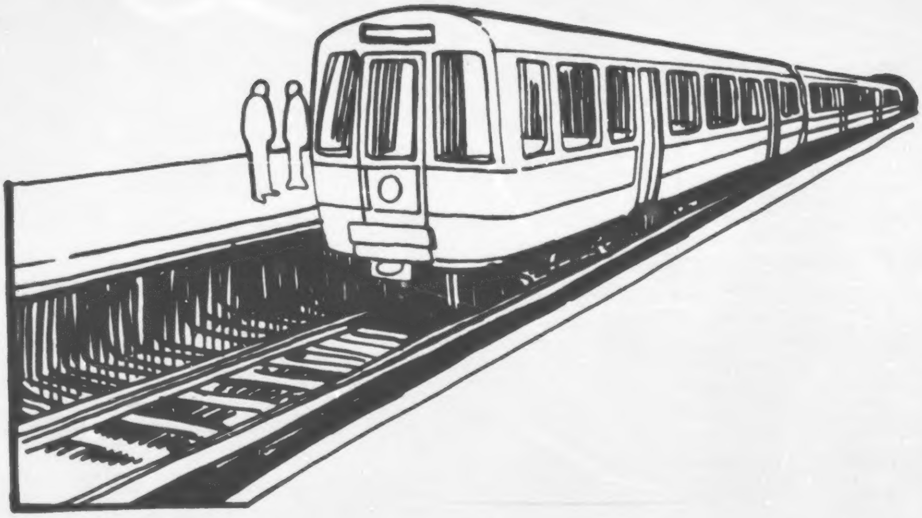
SHUTTLE VAN
(Demand Responsive Vehicle)



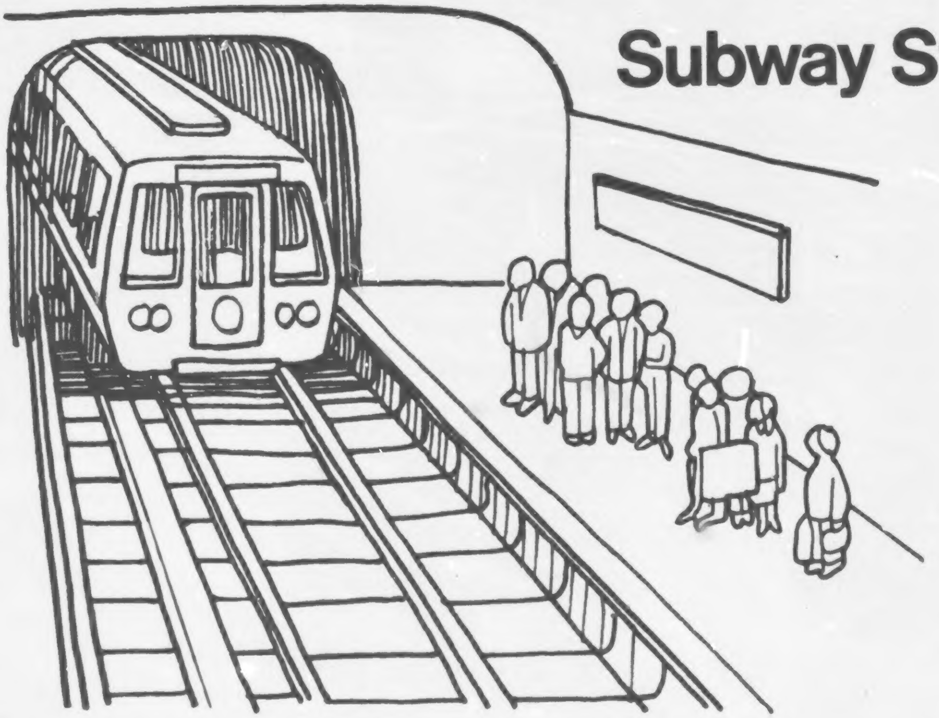


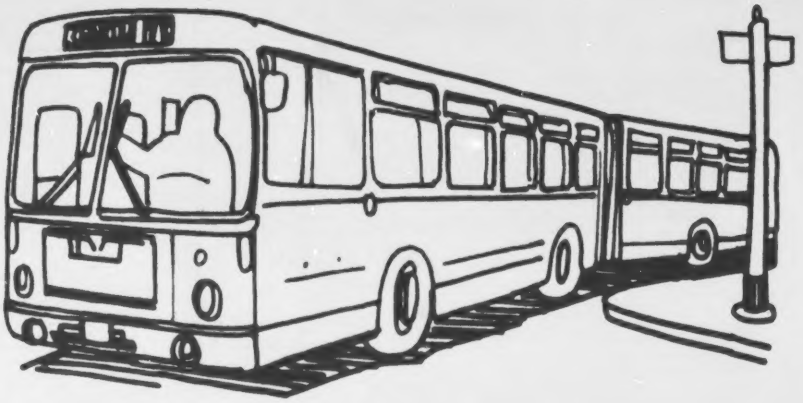
Taxi

Subway Car



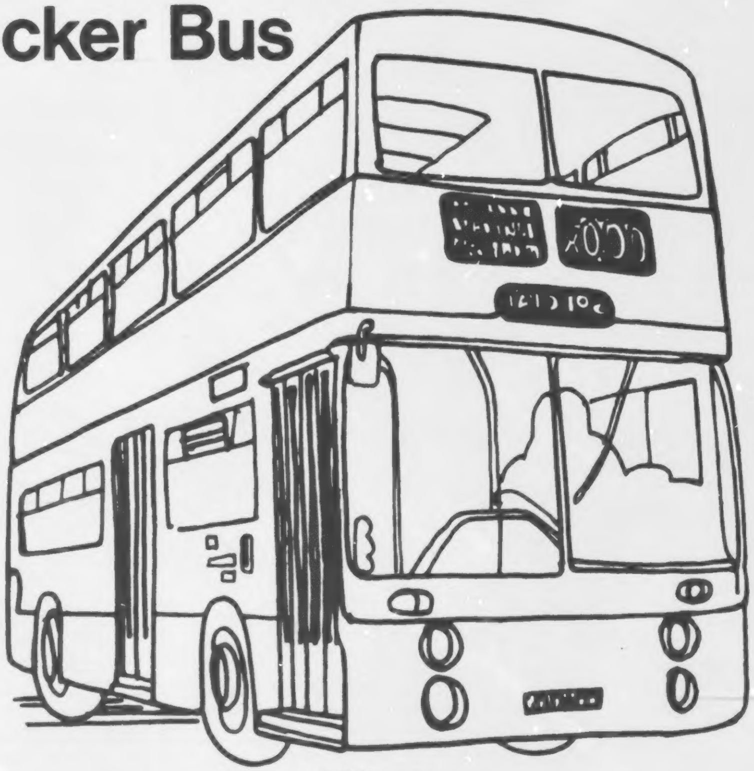
Subway Station

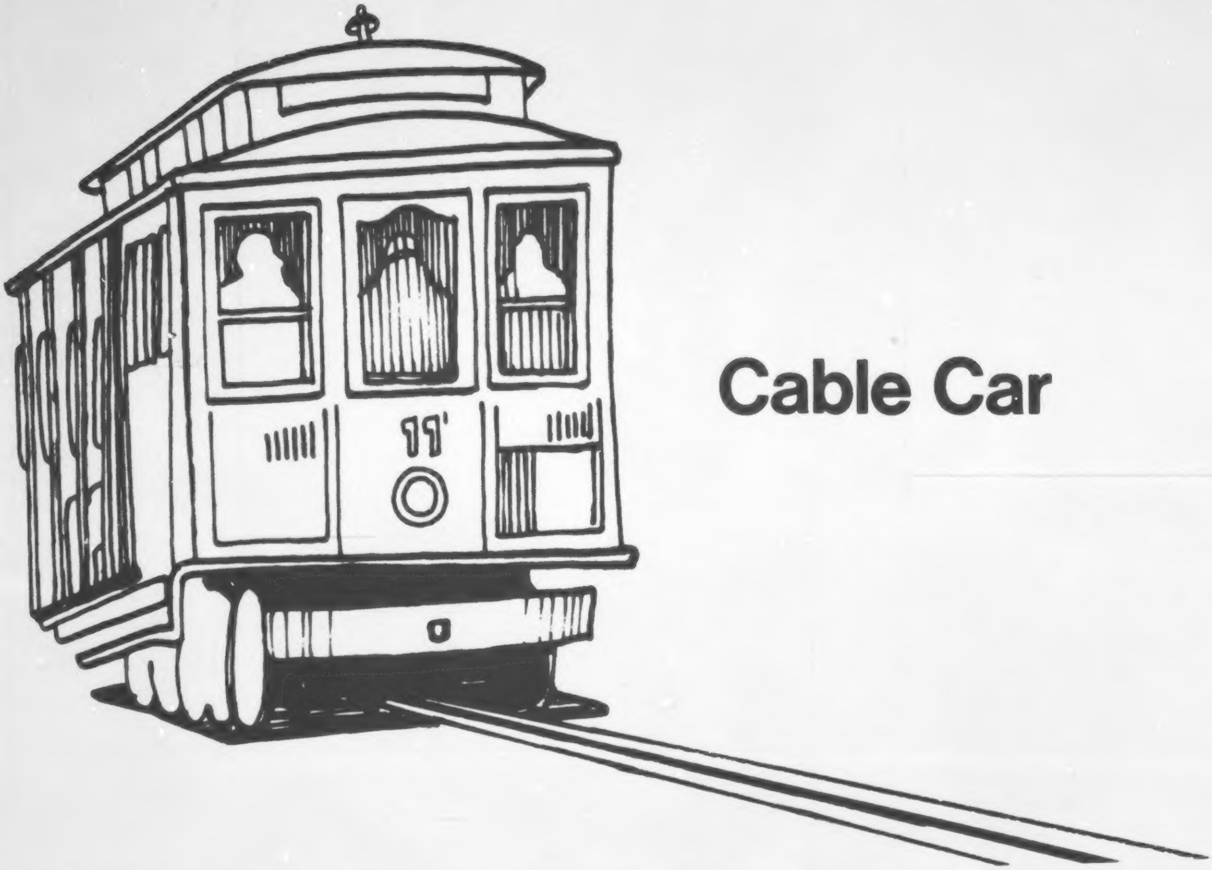




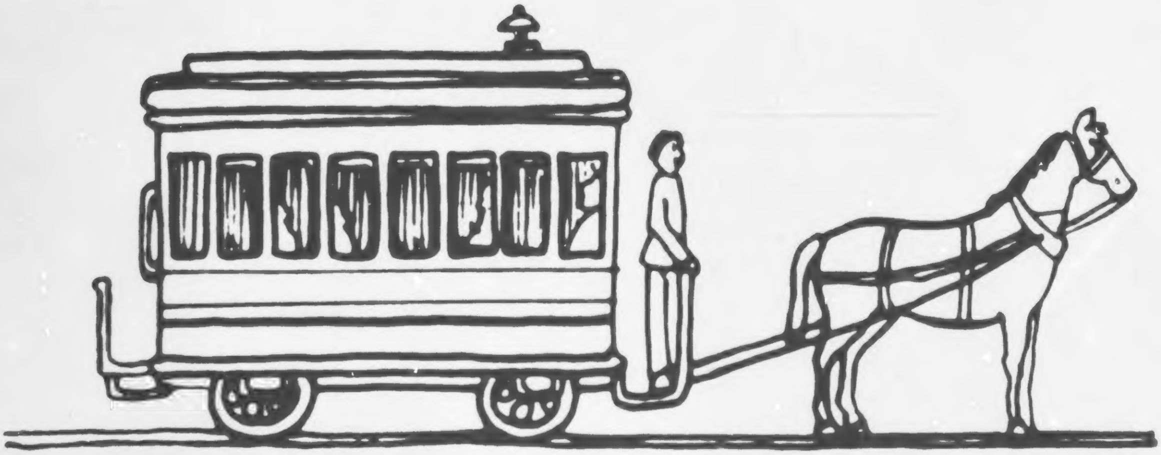
A NEW BUS
(Articulated Bus)

Double Decker Bus





Cable Car



Horse Drawn Tram

ACTIVITY #28

Mini-unit Topic: Discovering Modes of Public Transportation

Approximate Class Time: ½-1 period

Capsule Activity Description: Students respond to pictures of various modes of transportation.

Objective:

To show increased familiarity with the many modes of transportation by the end of the activity, students will be able to orally describe how at least one mode of transportation is used and by whom.

Concept Treated:

- By learning about public transportation vehicles, one is able to use them more appropriately.

Materials Needed:

Pictures of transportation vehicles.

ACTIVITY

In small groups or as a class, the students look at pictures of various modes of transportation with an emphasis on public transportation vehicles. You will need to provide a wide range of pictures which includes such modes as buses, subways, trolleys, trains, ferries, and taxis. Students respond voluntarily to the pictures in one of several ways.

- The students can describe what they see in the picture: What is the mode illustrated? How is it used? Who uses it? Have you ever used it? For what purpose?
- Students relate personal experiences they have had using the modes of travel discussed in the pictures.
- Each student creates a story based on all the modes of transportation discussed in class.

- Working in small groups, each student chooses or is given a picture of a different travel mode. One student starts a story based on his or her picture. The student will suddenly break off his or her story and the next student will pick up the tale where it was left off continuing the story based on his or her own picture. The story continues in this fashion around the group.

After students have become sufficiently familiar with the various kinds of transportation ask them to identify these means of travel within their own community. Some communities will have a large number of modes available making this an easy task, but other communities will have very few, if any, to identify. After pointing out your community transportation modes discuss why some areas offer many ways to travel while other communities can offer only a few.

ACTIVITY #29

Mini-unit Topic: Discovering Modes of Public Transportation **Approximate Class Time:** 2-4 periods

Capsule Activity Description: Students make large wall hangings of public transportation vehicles.

Objective:
By becoming aware of how different modes of transportation meet different needs, students will be able to describe orally the type of service provided by each mode of transportation dealt with in the activity.

Concept Treated:

- Wise consumers know how to compare the types of service provided by different modes of transportation.

Materials Needed:
Pictures of modes of transportation, mural paper or poster board, paint.

ACTIVITY

Review the modes of transportation, placing pictures around the classroom.

Break the class into small groups. Ask each group to choose a mode of transportation it has seen from the pictures. When the groups have come to a decision, give each group a large piece of mural paper or poster board. Students in each group are responsible for drawing, on a large scale, a side view of their transportation vehicle. The groups which chose the subway or train need only draw the side of one car. Specify the size of each vehicle so that the vehicles will be in proportion to one another.

Depending on the age or ability of your students, you may find it necessary to outline the transportation vehicles. Students design the exterior, cut out doors and windows, and name their vehicles. Older students may be able to draw the vehicles themselves, and some may even wish to elaborate on the basic design.

Once the projects are complete, cut out the vehicles and hang them around the room. If they don't all fit in the classroom, you might hang them on a rotating basis or put them in the hall or corridor outside the room.

Arrange chairs in front of each hanging transportation vehicle to resemble the various interiors (e.g., 4 chairs for a taxi, 10 or more for a bus, standing room on a ferry). Ask students to sit on the chairs to get the feeling for the number of passengers each vehicle can transport at one time. While still riding, discuss with the students the type of transportation each vehicle provides, the number of people that can travel at one time, where the vehicle goes, how it gets there.

Vehicle	*# of Passengers*	*Where Does it Go?*	*How Does it Get There?*
Bus	Many	Within a town or city, between towns and cities and states	Road
Subway	Many	Within a metropolitan area	Track which is separated from the roadway and usually underground
Taxi	Few	Within a town or city, between towns and cities	Road
Ferry	Many	Between towns and cities	Water
Train	Many	Within a city, between towns, cities and states	Track which is separated from the roadway
Trolley	Many	Within a city, between cities and towns	Track or wire which is usually on the roadway or beside it

The above chart may be put on the chalkboard and filled in while discussing the different modes of transportation. Other areas which might also be discussed and included on the chart are: cost, comfort, convenience, energy, and safety.

Variations and Supplementary Activities:

The transportation vehicle hangings can be made by the class reading groups and used as group banners or reading spot indicators.

The transportation vehicle hangings can be used as props for Activity #34.

Students can determine which mode of transportation they would most like to take to school each day and defend their choices in small groups or as a class.

ACTIVITY #30

Mini-unit Topic: Discovering Modes of Public Transportation

Approximate Class Time: 1½-2 periods

Capsule Activity Description: Students listen to a story about a town's transportation problems.

Objective:

By designing and drawing a public transportation system for a given community, students demonstrate their awareness of public transportation vehicles and how they are used by people with different needs.

Concepts Treated:

- There is a need for more than one way to travel.
- Different people have different transportation needs.
- Many people need public transportation.

Materials Needed:

Drawing paper, crayons.

ACTIVITY

Students listen to the story of "UpHill DownHill" (see attached story and accompanying illustrations). At its conclusion, discuss the various problems the town and its citizens may have because of a lack of transportation facilities (buses, trains, trolleys, taxis). You may want to list the characters in the story on the chalkboard and the different problems and needs of each. Ask the students if the terrain and climate in "UpHill DownHill" create any problems for Dr. Leroy in designing public transportation for them.

Discuss the problems and needs of the citizens of "UpHill DownHill," both those who are mentioned in the story and others who you and your students think might live there. For example:

Eleanor Elephant: Eleanor would need strong vehicles with wide doorways and seats to carry her around town.

Greg Guppy: Greg and his neighbors living in the water would need a special transportation system designed just for them.

Georgette Giraffe: Georgette would need vehicles with sunroofs, otherwise she would get a very stiff neck.

Martin Mouse: Mr. Mouse may need a special seating section to avoid being accidentally stepped on. However, he could probably travel for half fare or free because he is so small and doesn't take up a lot of space.

Brenda Blue Jay: Brenda doesn't really need public transportation unless she is traveling with friends who can't fly. Brenda and the other birds may not want public transportation in their community because they can get around so easily on their own.

When the students have a clear understanding of the situation and problems in "UpHill DownHill," they are to pretend they are Dr. Leroy, the inventor. Working alone or in pairs, the students draw the town of "UpHill DownHill" and the various vehicles and any other necessary trappings associated with public transportation (passenger shelters, bridges, tunnels, docks, etc.) which they propose to develop to make the citizens happy and the town a better place to live.

Variations and Supplementary Activities:

Students can color the illustrations from the story.

Students can make 3 dimensional scale models of "UpHill DownHill" using paper mache or shoe boxes.

Students can compare the problems of "UpHill DownHill" to those of their own community and the people who live there.

Uphill Downhill*

Have you ever been to UpHill DownHill? Well, here is what happened there...

Elihue and Eleanor, the Elephant twins, gave a fair and nobody came. It was, needless to say, very sad.

One day in Spring, Elihue and Eleanor were sitting around moaning and groaning and tapping their trunks. They were bored silly, because there was nothing to do. "Urrdurr," said Elihue. "Durrurr," said Eleanor in agreement, "nothing, nothing, nothing to do." "Well," said Elihue. "Can't we think of something?" They thought. After a great deal or urring and durring they came up with a terrific idea: a fair! (Picture 1) Eleanor could see herself selling kisses by the trunkfull, and Elihue saw himself giving rides to all the other children in UpHill DownHill. They decided to do it.

(Picture 2) First they called Sandy Spaniel, who immediately agreed to be the barker. Then they called Greg Guppy, who said that he would just love to do an underwater ballet. They even called Brenda Bluejay, who was very enthusiastic about doing some stunt flying. In no time flat they were organizing a fair that would give them and all of their friends something to do. Suddenly everyone in UpHill DownHill had all kinds of energy. Even Gramma Cat was busy as a bee cooking up skeins and skeins of cotton candy. Those who weren't planning to help run the fair planned to attend to play the games, see the shows and ride the rides.

Now it is necessary to mention that in UpHill DownHill, which was very, very hilly (some of the hills went up and some of them went down), the only way to get anywhere was to walk. Because of the hills, it was often difficult to get places. For example, some of the children were sometimes late for school because the walk uphill to the school left them breathless. They had to stop several times to rest. Many of the old people had given up going anywhere at all. That was because when they tried to walk downhill they lost all control of their feet and accidentally ran, tiring themselves beyond all reason. The lack of transportation in UpHill DownHill was quite a problem.

Elihue and Eleanor worked and worked on their fair. Because they were having such fun looking forward to the happiness the fair would bring they really didn't mind all the hard work. (Picture 3) The twins toted board after board to build booths and benches and a merry-go-round. Eleanor smoothed the ground with her big feet and sprayed the dirt with water through her trunk to keep the dust down. Elihue pounded nails into boards, hung curtains around booths, and set up all the games. Sandy Spaniel practiced her barking until she was certain that no one would be able to resist coming to the fair. Greg Guppy did nothing but eat and swim in preparation for his water ballet. The day before the fair they were all sure of success--a happy, carefree, fun day for everyone in UpHill DownHill. Brenda Bluejay flew over the town dropping leaflets telling everyone about the fair.

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*This story was written for this activity by Ann M. Nihal of Burlington, Vermont.

The morning of the fair, Elihue and Eleanor jumped out of their beds feeling wonderful. One look out the window, however, dampened their spirits beyond belief. It was raining. (Picture 4) It was not raining a gentle, soft Spring rain, but it was raining cats and dogs. The water was falling in sheets and bouncing off the streets. As a matter of fact, the streets were (they couldn't believe their eyes) sort of flooding--there was an inch of water in the gutter already.

Pretty soon Elihue and Eleanor's phone began to ring. (Picture 5) "Well," said Gramma Cat, "I'm sure you can see that I will be unable to come to the fair. If there were a bus or a trolley that I could take, everything would be all right. But as it is, it would be impossible to wrap my skeins and skeins of cotton candy well enough to keep them from melting. I'm truly sorry, children, but I'm sure you can see that I will be unable to come."

"Well," said Greg Guppy, "I may be used to large amounts of water, but, you see, my water isn't usually moving. I mean, water running in the gutter just isn't a fishbowl, is it? If there were just some way for me to reach the ballet booth I'd come; but as it is it would be impossible for me to get there. I know you'll understand."

"No," said Sandy Spaniel. "Out of the question. My family spent all day yesterday grooming and brushing me, and I even borrowed my father's straw hat to wear. It's simply impossible for me to get to the fair grounds without ruining my coat and hat. Surely you can see that I won't be able to come?"

"Good grief," said Brenda Bluejay, "surely you do understand. Visibility is absolutely zero; I really don't think that even an instrument landing would be possible. I'm terribly sorry, but stunt flying would be much too dangerous today."

Elihue and Eleanor, being big and sturdy and also in need of a shower, went to the fairgrounds and waited all day. Eleanor was hopeful that someone would want just one kiss, and Elihue could hardly believe he wouldn't get to give anyone a ride. But despite the fact that they waited and waited nobody came. "Rats," said Elihue. "This isn't fair!"

The next day Elihue and Eleanor were hanging around once again wondering what to do with themselves, feeling even more bored and frustrated than usual because of the miserable failure of their fair. "Urrdurr," said Eleanor. "Durrurr," said Elihue in agreement. "What this town needs is transportation. (Picture 6) Do you realize, Eleanor, that the fair could have happened if only UpHill DownHill had a bus or a trolley or a train or *some*thing?" Just as Elihue mentioned this to Eleanor she remembered that she'd read a story in the UpHill DownHill newspaper only a week before about Dr. Leroy Fox, a transportation expert and inventor. "Elihue," she said, "what this town needs is Dr. Leroy Fox!" Eleanor explained to Elihue that Dr. Fox was a transportation expert and inventor. Together they ran to the phone book to look up Dr. Fox's number. (Picture 7) Within a few minutes they were talking to Dr. Fox and full of enthusiasm once again. This time they were sure they would bring happiness to everyone in UpHill DownHill. They were even making plans for their next fair--to which everyone would undoubtedly be able to come.

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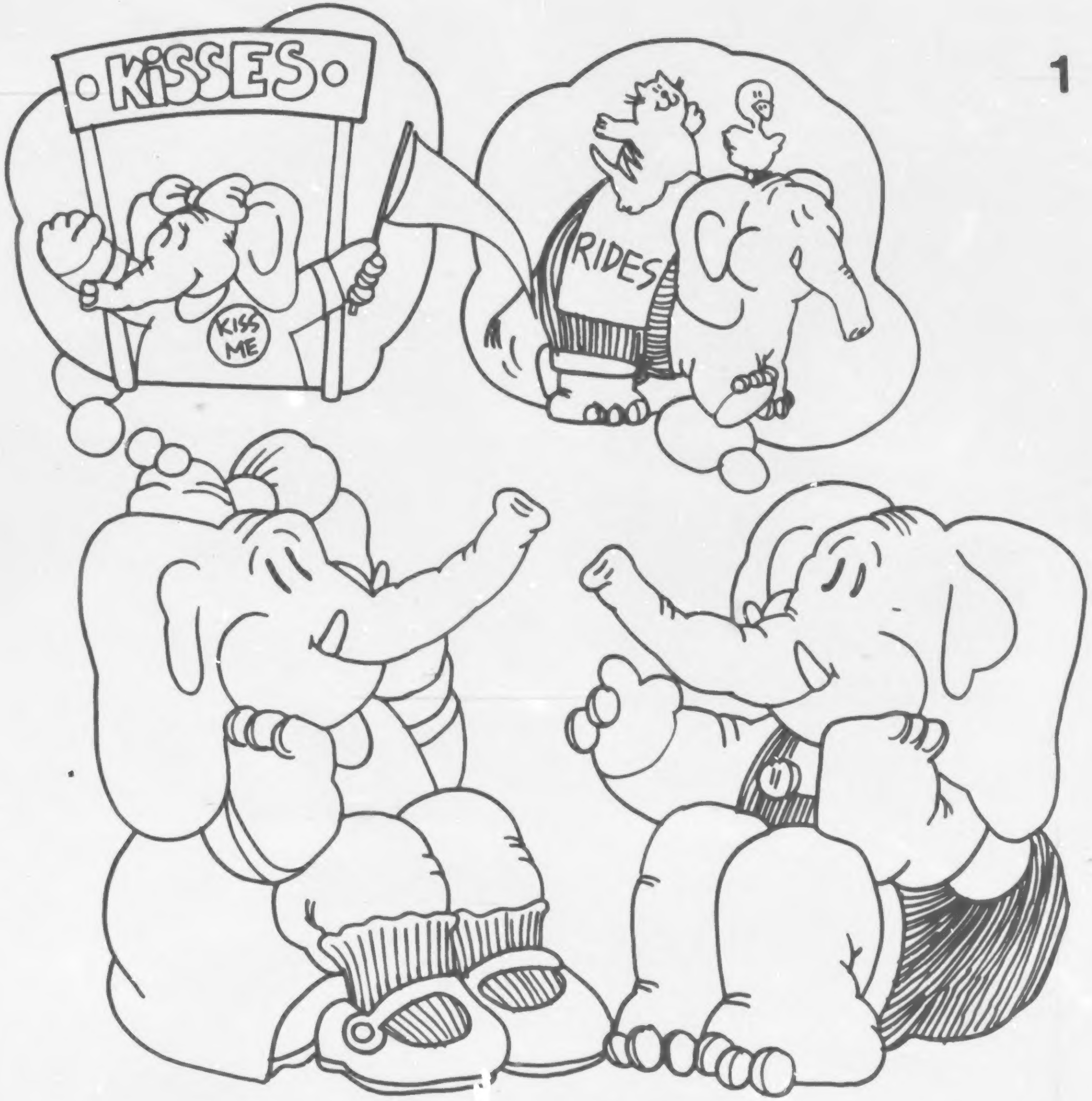
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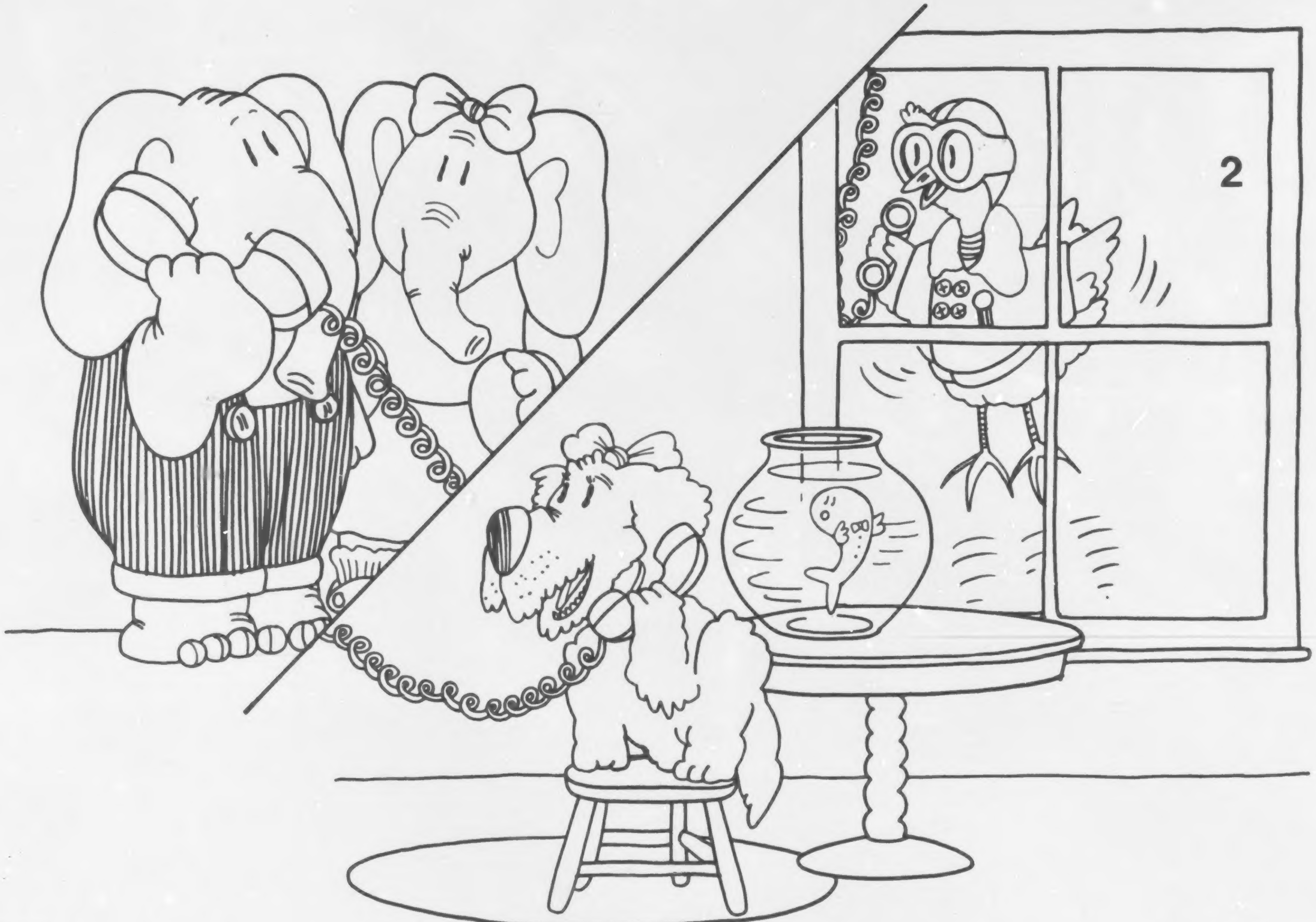

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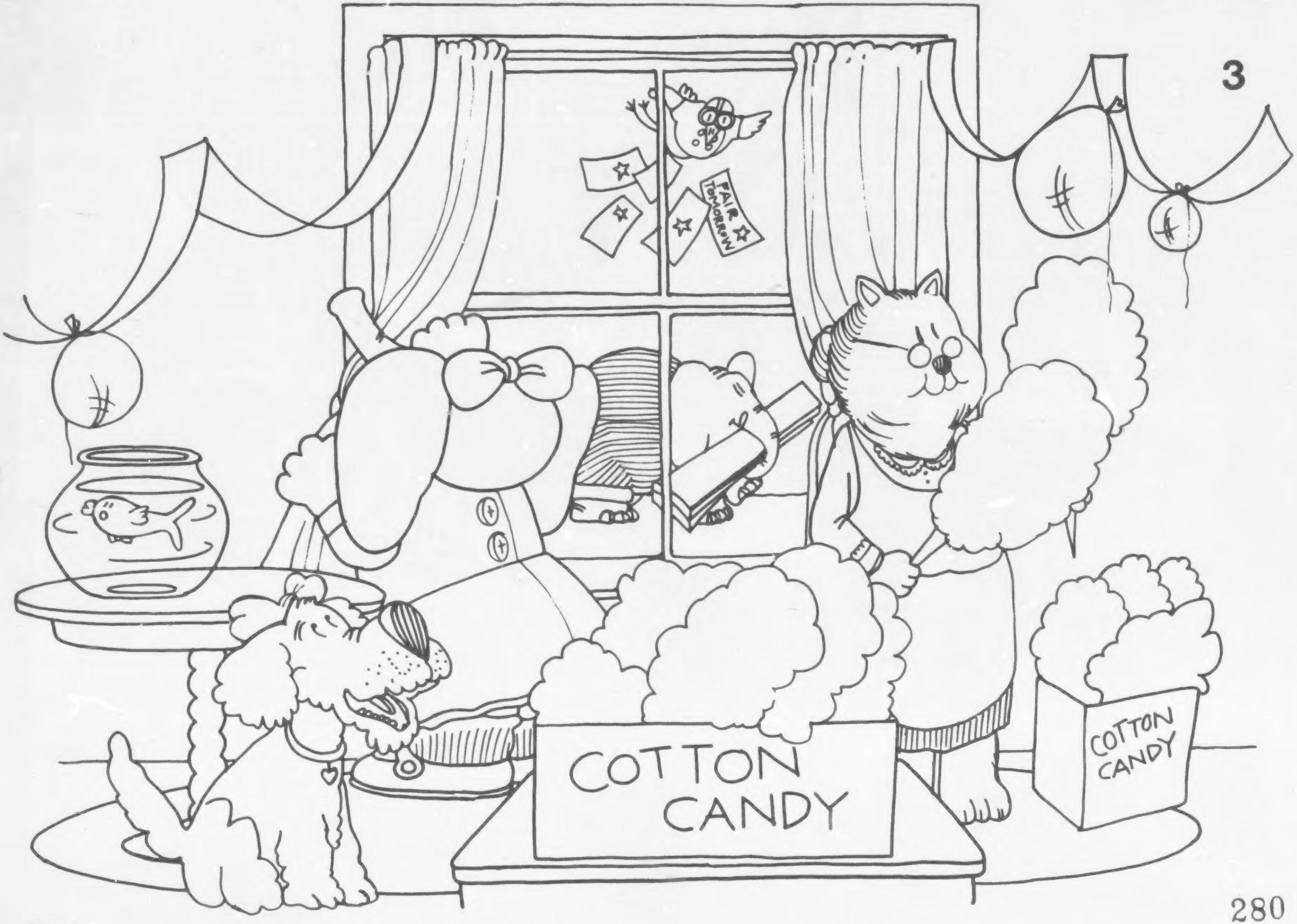
FAIR ☆ TOMORROW ☆
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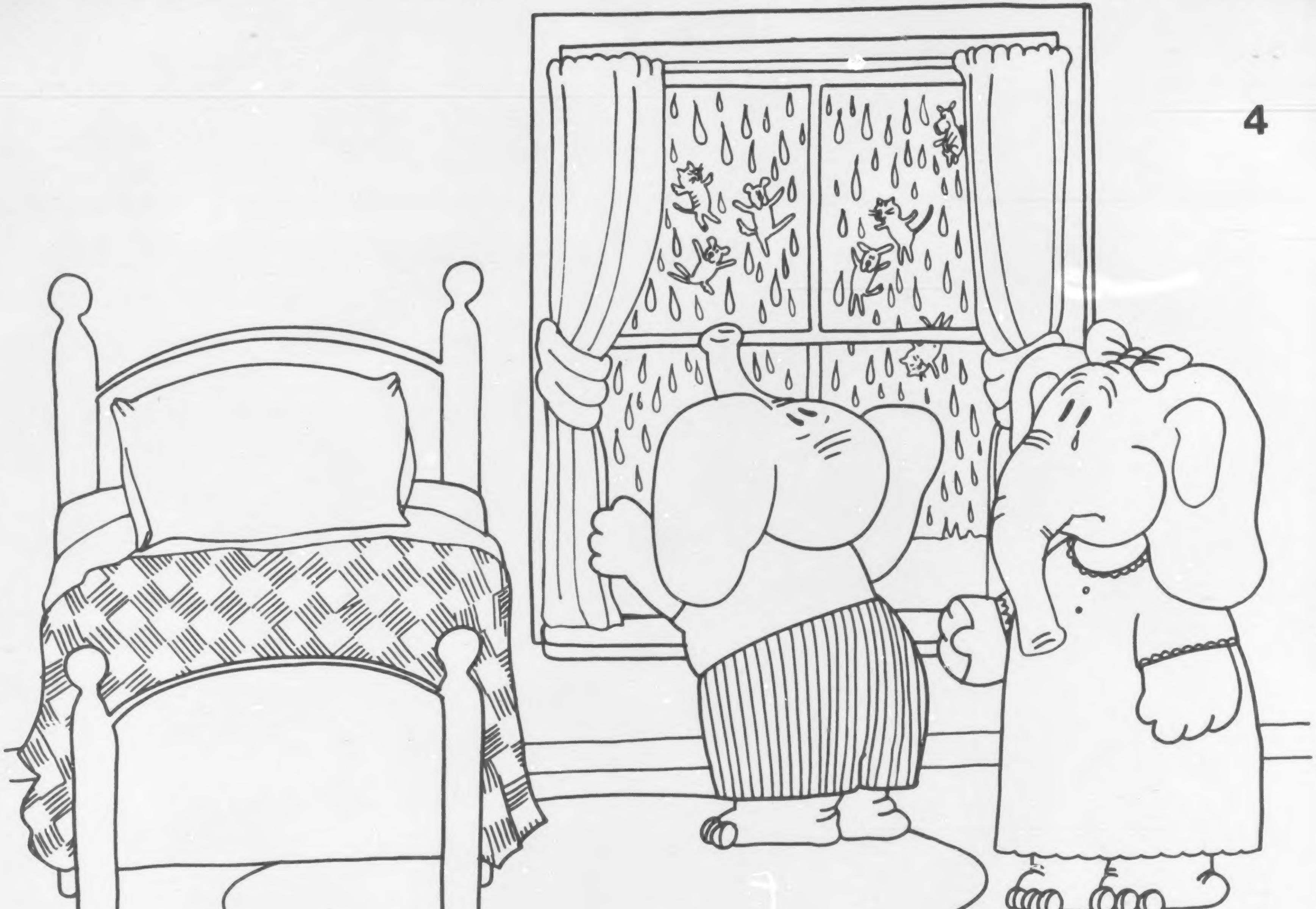
COTTON CANDY



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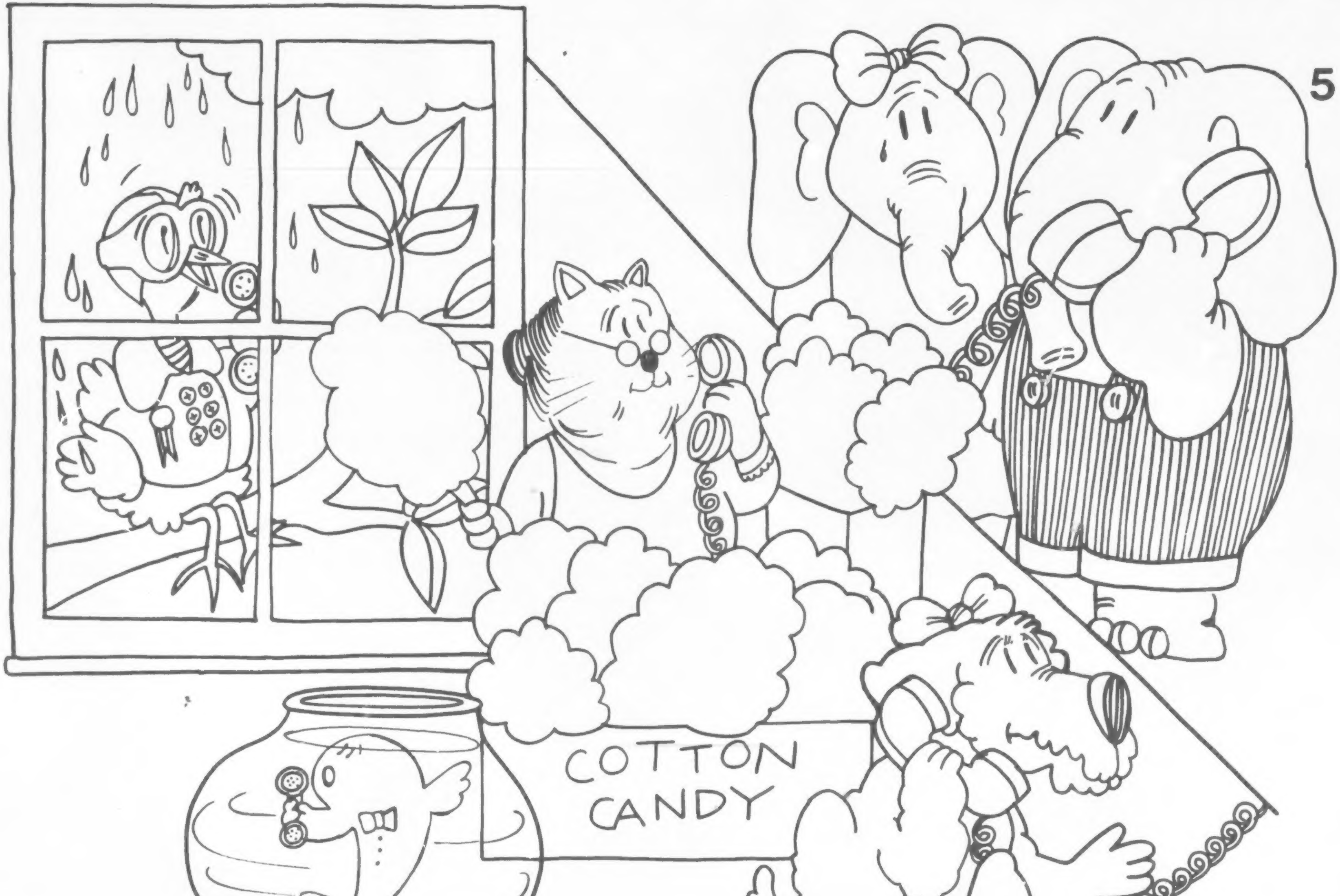
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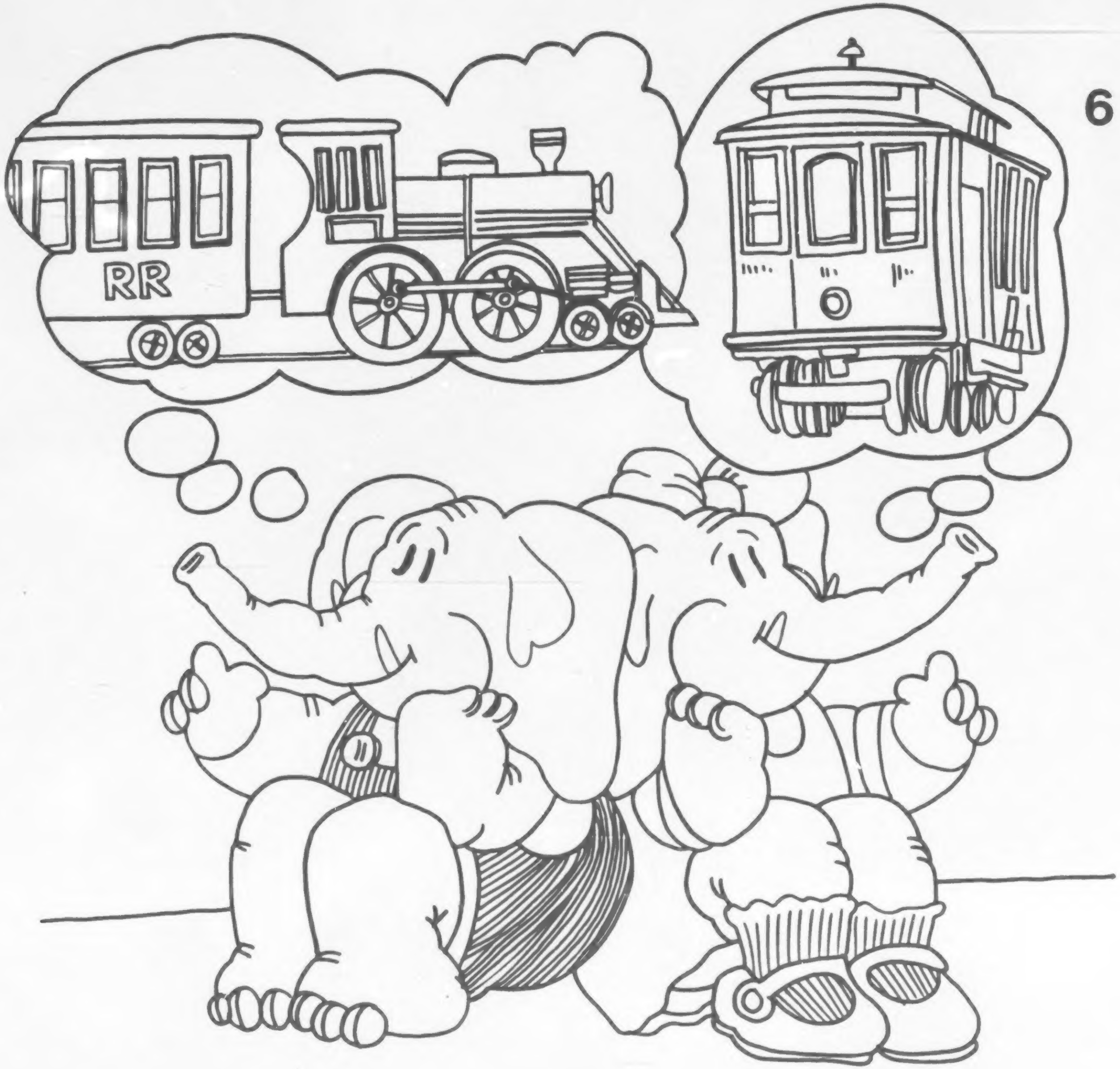
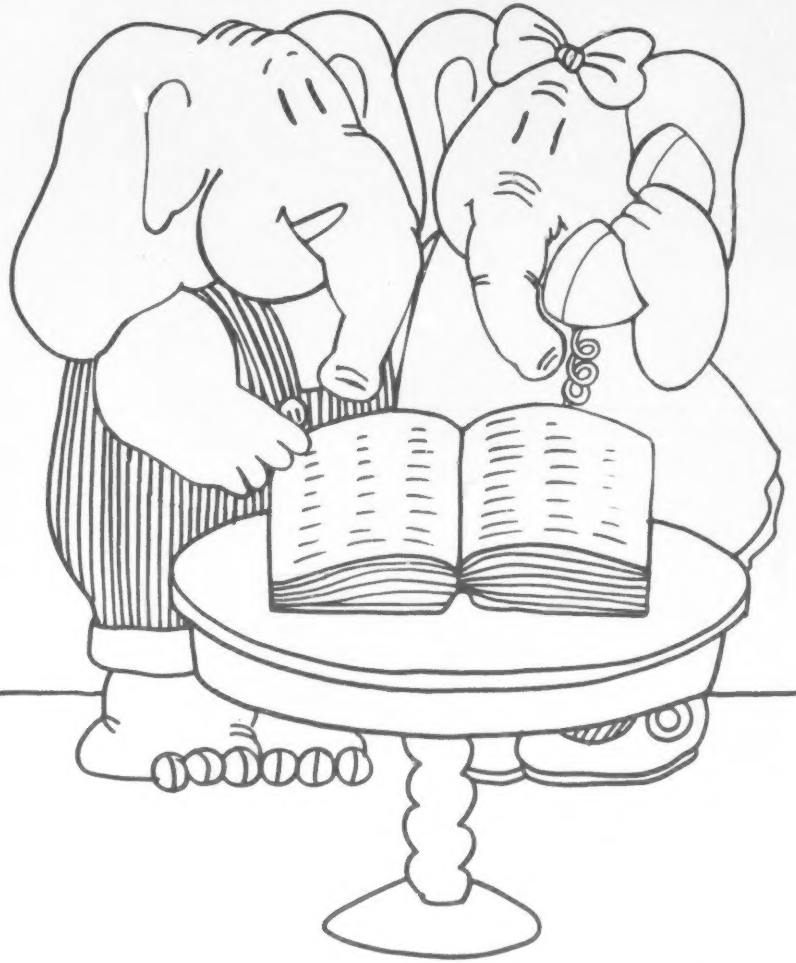


CAN YOU HELP ?

7



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MINI-UNIT 10

LEARNING TO MAKE TRANSPORTATION DECISIONS

After students have become familiar in the preceding mini-unit with the many ways to travel and are able to identify them readily, students can easily move on to learn who uses transportation, for what purposes they use it, and how they use it.

This mini-unit develops awareness and knowledge of the many ways people travel, in general, and use public transportation, in particular. Students become aware of their own and other people's tremendous dependency on transportation in all aspects of our daily lives. The activities also allow students to experience using public transportation both in real life and through a simulation.

Some of the concepts developed in this mini-unit include

- We are all dependent on travel.
- There are often alternatives to the ways people choose to travel.
- To make wise choices about transportation, one can use a logical decision-making process to select a travel mode.
- Different communities offer different kinds of public transportation and some systems are more adequate than others.
- There are many problems associated with public transportation and one should learn how to cope with them.

Note: Activity #31 in this unit is also used in Mini-unit 9 as Activity #27 because it is especially helpful in introducing the concept of transportation. If, however, you precede Mini-unit 10 with Mini-unit 9, you should not need to repeat this introductory activity.

MINI-UNIT 10 LESSON PLAN

Learning to make transportation decisions

Activity #	*Activities*	*Class Time*
31[a]	DESCRIPTION: Students make a list of the many ways to travel.[a] OBJECTIVE: To demonstrate awareness of the field of transportation, students will be able to recognize and name at least 10 modes of transportation by the end of the activity.	1 period
32	DESCRIPTION: Students assess their travel needs and their use of and ability to use public transportation. OBJECTIVE: After keeping their travel logs, students will be able to name at least three different ways they travel and give one reason why they need each of those different ways to get around.	2½-4 periods
33	DESCRIPTION: Students take a ride on a public transportation vehicle. OBJECTIVE: By the end of the activity students will be able to list the steps involved in using a given public transportation vehicle.	2-3 periods
34	DESCRIPTION: Students review transportation modes by making collages and mobiles then discuss community transportation and a common transportation problem. OBJECTIVE: By the end of the activity, students will be able to demonstrate awareness and understanding of public transportation by being able, orally or in a drawing, to define rush hour and to describe one way to cope with it.	2-2½ periods

Total Class Time: 7½-10½ periods.

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[a] This activity also appears in Mini-unit 9.

ACTIVITY #31

Mini-unit Topic: Learning to Make Transportation Decisions

Approximate Class Time: 1 period

Capsule Activity Description: Students make a list of the many ways to travel.*

Objective:

To demonstrate awareness of the field of transportation, students will be able to recognize and name at least 10 modes of transportation by the end of the activity.

Concept Treated:

- There are many different ways for people to travel.

Materials Needed:

Pictures of transportation vehicles, flash cards.

ACTIVITY

Ask students to think of all the ways that people and goods travel. As the students call out the different modes, list them on the chalkboard. You can compile one master list or several smaller lists by categories as follows:

- Vehicles that travel on land
- Vehicles that travel on water
- Vehicles that travel in the air

You might also show the class pictures of the vehicles as they are mentioned, or, when the list is complete, reinforce the modes by asking several students to match the pictures of the vehicles with their appropriate names as written on the chalkboard. (Several pictures of public transportation vehicles have been included at the end of Activity #27. You may also find the Glossary at the end of this chapter helpful for this discussion.)

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*This activity also appears in Mini-unit 9.

Next divide the class into two teams. Place the pictures of the transportation modes around the room so that students can easily see them. Using flash cards with the names of the modes written on them, students play a game matching names to pictures.

- The first student on Team A steps forward.
- Hold up a flash card.
- The student must say the word(s) on the card, then match the card to the picture by placing it in front of the illustration.
- If the student is correct, he or she returns the card to you and goes to the end of the line.
- If the student is incorrect, he or she takes his or her seat and the next student on that team takes a turn answering that same flash card.
- Once one team's members have all taken their seats because of missed matches, the other team is declared the winner. Or, the team left with the most players still standing at the end of the time allotted for the game wins.

As a project to be done in their spare time or as homework throughout the unit, each student compiles a travel scrapbook. This scrapbook contains all the ways there are to travel. Pictures can be cut from old magazines, or can be drawn and colored by hand. Students can start their books by coloring in the public transportation vehicles that appear on Spirit Masters #8 and #9.

Variation or Supplementary Activity:

Students can draw a neighborhood they are familiar with in their town or city and indicate on the drawings all the ways people travel in their community.

ACTIVITY #32

Mini-unit Topic: Learning to Make Transportation Decisions

Approximate Class Time: 2½-4 periods

Capsule Activity Description: Students assess their travel needs and their use of and ability to use public transportation.

Objective:

After keeping their travel logs, students will be able to name at least three different ways they travel and give one reason why they need each of those different ways to get around.

Concepts Treated:

- We are all dependent on transportation.
- There are often alternatives to the ways people choose to travel.
- To make wise choices about transportation, one can use a logical decision-making process to select a travel mode.

ACTIVITY

For a period of several days, students, either as a class or in small groups, keep a log of all the traveling they do by motorized and nonmotorized modes of transportation; bus, bicycle, walking, and so forth. An excerpt from a sample log follows.

Tuesday

Rode bus to school
Took bus home
Rode bike to Billy's house
Billy's mother drove us to the pool and home again
Rode bike home
Took bus to library
Walked home

Wednesday

Took bus to school
Went on field trip to local dairy by bus
Took bus home from school

Mother drove me to trumpet lessons
Walked home
Walked to drug store and home again

Thursday

Mother drove me to school this morning (missed bus)
Mother picked me up at school--had to go to the dentist
Picked Dad up at the train station and went home

At the end of the week, students tabulate their total number of trips and the number of trips by each transportation mode used. A running total is kept on the chalkboard or on a wall chart.

Discuss some or all of the following issues with the class.

- How could your life be different if there were no way to travel even short distances?
- If all automobiles suddenly disappeared, how would people get around?
- If your parents' car were stolen or in the repair shop for a long time, how would that affect your ability to get around?
- If you aren't using public transportation (e.g., bus, subway, trolley), could you easily use it if you wanted to? Why or why not?
- If there is no public transportation in your area, should there be?

Using their logs, students determine if they would be able to travel by only one mode of transportation to the places they usually go. It should be noted that often we use various modes of transportation because one or more is appropriate to our needs at that time or more accessible. The decision of whether or not to use public transportation is one that each person must make every day and in light of various factors.

When this exercise is completed, discuss the availability and accessibility of local public transportation and what can or should be done to improve it, if necessary.

Variation or Supplementary Activity:

Students can make up recommendations for the local public transportation systems and send their suggestions to local authorities for comment.

ACTIVITY #33

Mini-unit Topic: Learning to Make Transportation Decisions

Approximate Class Time: 2-3 periods

Capsule Activity Description: Students take a ride on a public transportation vehicle.

Objective:
By the end of the activity students will be able to list the steps involved in using a given public transportation vehicle.

Concept Treated:

- One should learn how to use public transportation and know what to expect when doing so.

ACTIVITY

Arrange for a field trip to a local transportation facility (e.g., subway station, trolley barn) or arrange for a vehicle to be brought to the school (many public transportation systems are more than willing to bring a bus to school for demonstration purposes). Request that, if at all possible, students be allowed to ride in a vehicle as if they were actually using that mode of transportation (e.g., putting money in fare box, watching for their stop). This enables students to learn how to use public transportation in a controlled setting, without the fear which usually accompanies an initial experience.

Prior to the trip, discuss with the class what they will see and should look for while on their tour of the facility or riding in the vehicle. (If there are no public transportation facilities in your community, provide the students with the information necessary to use public transportation, then have the class simulate the process of using a mode of public transportation.)

If your focus is on buses, some of the things you might want to discuss follow.

- What kind of people work in a bus company? What do they do there?

- If you wanted to go by bus to _______________ (name of the next town or city), what are some of the things you would have to find out about in order to get where you want to go?

- If someone told you that you needed correct change to take the bus, what does he mean?

- If you weren't sure at which stop you were to get off the bus, what would you do?

- How should a person act when he or she uses public transportation? Why? Who gets hurt when someone damages a bus? Who pays to fix that damage?

When you return from your field trip, make a list of all the things the students noticed while riding in the vehicle or touring the facility (e.g., ticket counter, turnstyle, maps, signs, newspaper stand). As a class discuss the function of each of these things and how they benefit the passenger.

Next, students determine the steps and draw up a set of travel guidelines for successfully taking a trip on a bus or other public transportation vehicle. Once the class has outlined the steps needed to be followed, ask several students to simulate the process. The class comments on the role play and revises its travel guidelines accordingly.

Variations and Supplementary Activities:

Prior to the field trip, you can hold a contest to name one or more vehicles at the facility you will be visiting. Check with the authorities at the facility for permission for your students to christen a vehicle by giving it a name or, in some way, decorating it. There might also be the possibility of holding a contest in your school or community, in cooperation with the local bus, taxi, subway, or commuter train company, to permanently name a fleet of their vehicles--Brenda Bus, Speedy Subway, Truckin' Train, Tooting Trolley.

Students can compile a Travel Guidelines Booklet to aid public transportation users.

ACTIVITY #34

Mini-unit Topic: Learning to Make Transportation Decisions

Approximate Class Time: 2-2½ periods

Capsule Activity Description: Students review transportation modes by making collages and mobiles then discuss community transportation and a common transportation problem.

Objective:

By the end of the activity, students will be able to demonstrate awareness and understanding of public transportation by being able, orally or in a drawing, to define rush hour and to describe one way to cope with it.

Concepts Treated:

- There are many ways to travel.
- Different communities offer different kinds of public transportation and some systems are more adequate than others.
- There are many problems associated with public transportation and one should learn how to cope with them.

Materials Needed:

Construction paper, magazines, scissors, crayons, string.

ACTIVITY

To familiarize themselves with, or as a review of, the various modes of public transportation, students make collages or mobiles using pictures cut from magazines or drawn by hand. Possible themes for the projects follow:

- A collage or mobile displaying variations within one mode of public transportation
- A collage or mobile displaying various modes of public transportation common to the community
- A collage or mobile displaying different modes of public transportation

- A collage or mobile displaying the different modes of public transportation the student has used

When the projects are completed, individual collages are put together on the bulletin board to form one large collage. Mobiles are hung from the ceiling. Letters are cut from newspapers to form the names of the various vehicles displayed around the room and posted alongside the bulletin board or hung from the mobiles.

The class then discusses each vehicle illustrated as a mode of public transportation and its use in the community or in a nearby community.

- How many public transportation modes are common to the area you live in? What are they and how are they used? Do you think you have enough or too many or too few public transportation facilities where you live? Why?
- Can you mix travel modes; how many combinations are available in your community (e.g., bus and train, automobile and bus, bike and automobile, walking and bus)?
- What is carpooling? Do people in your community use carpooling?
- How many different modes of public transportation have you used? Where? Did you like one better than the others? Why?
- Do you know if people ever have any problems using public transportation? What are some problems? Does rush hour cause people problems in getting places? Do you know what rush hour is? Does this community have rush hours? What happens at rush hour?
- Why is public transportation better for the environment? How does public transportation help to relieve traffic congestion?

To simulate rush hour, place some chairs together at the front of the room to resemble the interior of a bus. Indicate the door to the vehicle. Appoint a student (or ask for a volunteer) to act as bus driver and call out the bus stops (from a list supplied by you) along the route. Set up several bus stops and assign students a stop at which they are to get off the bus. Tell the passengers to get on and off the bus as if they were in a rush to get home. All the students board the bus together. The bus should be packed, all seats filled and passengers crowding the aisles. At various intervals, the driver stops the bus, opens the door, and calls out the name of the stop. Students assigned that stop wend their way to the front of the bus to get off. Tell the bus driver to skip one of the bus stops accidentally. When all the students have gotten off the bus and returned to their seats, except for the passengers who have missed their stop, and the bus has come to the end of the line, the driver announces "Last stop--everybody out!" The passengers still on the bus are told they will have to wait 20 minutes for another bus that will take them back to their stop. The temporarily stranded passengers should react to the driver's announcement accordingly.

After the bus ride, discuss the situation with the class.

- Why did some passengers miss their stop (new to area, asleep, couldn't see out windows, too crowded, careless driver)? How could this have been avoided? Who's fault was it?

- Why did so many people get on this one bus? Why didn't anybody wait for another bus?

- Why do people ride on the bus if it is always this crowded and uncomfortable? What would you do?

- Are there any dangers or problems (other than missing a stop) that might result from overcrowding?

- Do you think other public transportation modes (rapid transit and light rail systems, taxis, ferries, trains) have similar problems at rush hour? What can be done to help this problem?

- Do automobiles have rush hour problems? What would happen if everybody who normally used public transportation started driving their cars to work?

Variations and Supplementary Activities:

Students can use vehicles made in Activity #29 as props for this exercise.

Students can make up a list of rush hour hazards and decide how to cope with them.

MINI-UNIT 11

USING PUBLIC TRANSPORTATION SAFELY

Although it is unlikely that most students will ever be involved in a major emergency on a public transportation vehicle, it is wise to make students aware that such emergencies can and do happen. Knowing what to do and what to expect in an emergency may help people to cope with one, should it occur. This mini-unit, by dealing with the coping theme, is a logical extension of the previous unit. Knowing what to expect in various situations when using public transportation makes actually using it that much easier and safer.

This mini-unit offers students an opportunity to discuss various emergencies and what to do in those situations, and then to role play or act out skits demonstrating various kinds of behavior related to the use of public transportation.

The knowledge and skills developed in this unit are also transferable. Students will be better able to respond to emergency situations related to automobile, airplane, and bicycle travel by applying what they learn here to other transportation emergencies.

MINI-UNIT 11 LESSON PLAN

Using public transportation safely

Activity #	*Activities*	*Class Time*
35	DESCRIPTION: Students describe emergencies they have experienced involving personal safety and relate these emergencies to travel emergencies on public transportation vehicles. OBJECTIVE: Students will demonstrate an awareness of emergency situations and the different ways of reacting to and dealing with them by describing through a role play at least one way to cope safely with a given emergency situation.	1 period
36	DESCRIPTION: Students perform skits demonstrating the procedures for proper and safe behavior while using public transportation. OBJECTIVE: Students will demonstrate knowledge of safe public transportation user behavior by being able to describe orally or in a drawing at least two potential problem areas to watch for when using public transportation and at least one way to cope with each.	1-2 periods

Total Class Time: 2-3 periods.

ACTIVITY #35

Mini-unit Topic: Using Public Transportation Safely

Approximate Class Time: 1 period

Capsule Activity Description: Students describe emergencies they have experienced involving personal safety and relate these emergencies to travel emergencies on public transportation vehicles.

Objective:

Students will demonstrate an awareness of emergency situations and the different ways of reacting to and dealing with them by describing through a role play at least one way to cope safely with a given emergency situation.

Concept Treated:

- One can learn what to expect and how to act in an emergency.

ACTIVITY

Students describe to the class incidents in which they were personally endangered and had to react quickly (or failed to do so and were injured or almost injured). Students who have never personally experienced a situation in which they were in imminent danger of being hurt can either describe situations in which fast thinking or action was required to avoid an unpleasant occurrence (e.g., ice cream falling off a cone, lamp falling to the floor) or they can describe situations they have seen on television or in the movies in which somebody was in imminent danger of being hurt.

Examples of dangerous situations students may have been involved in where quick thinking or action was necessary of highly desirable include

- Falling out of a tree
- Losing control of or falling off a bicycle
- Falling down stairs
- Avoiding falling or flying object

- Coping with an injury to a friend
- Rescuing someone from drowning
- Being carried away from shore by a fast water current
- Being lost
- Putting out a fire
- Rescuing someone from a fire
- Being outside during an earthquake shock
- Stopping bleeding from a deep cut
- Helping someone bit by an animal

After listening to each other's stories, students discuss their experiences along the following lines:

1. Had the students received any prior warnings about how to behave, should these emergency situations materialize?

2. Were they able to implement these suggestions when the emergency actually occurred?

3. If they had not received any prior emergency instructions, do they feel that advance warning of what to do would have been helpful?

4. Did any students, without prior instructions about how to handle the emergency, respond correctly anyway?

5. Do students feel they would respond differently the next time a similar emergency occurred? The next time any emergency occurs? Why?

Students then identify sets of instructions they have been given at some time in their lives for how to react to emergencies, such as fire drills; earthquake drills; airplane emergency instructions; various automobile emergency instructions; getting a cramp while swimming; or coping with a snake bite, bee sting or tick.

The activity concludes with a discussion of the utility of instructions on what to do in an emergency, particularly an emergency situation on a bus, subway, or train. Discussion points can include

1. What are some of the things people should do in a subway, train, or bus emergency?

2. Do people have to go through an emergency, perhaps several times, in order to be able to handle one properly? Are there some emergencies which require actual experience to handle properly, while others can be dealt with effectively with prior instructions only?

3. Is there some advantage to being told in advance not only what to do in an emergency, but how one can expect to react or feel during one (e.g., panic, inability to move, freezing)?

ACTIVITY #36

Mini-unit Topic: Using Public Transportation Safely

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students perform skits demonstrating the procedures for proper and safe behavior while using public transportation.

Objective:

Students will demonstrate knowledge of safe public transportation behavior by being able to describe orally or in a drawing at least two potential problem areas to watch for when using public transportation and at least one way to cope with each.

Concept Treated:

- One can learn what to expect and how to act in an emergency.

ACTIVITY

Working in small groups, students prepare skits for other students and their parents, alerting them to the proper ways to use public transportation and appropriate safety measures. Assign or ask groups to choose a topic to present in skit form. For example:

- How to act in an emergency situation (fire, collision, falling on tracks)
- How to check the public transportation vehicle you are using for safety features and knowing how these features operate
- How to get on and off public transportation vehicles safely
- Things to know and/or carry while traveling on a public transportation vehicle (correct change, system maps, station stops, information center and complaint department locations)
- Special safety problems of elderly, young children, and handicapped, and how to cope with these problems

Each group presents its skit to the other students who act as critics, judging the material according to the following criteria:

1. Does the skit or message convey its intention?
2. Is there too little or too much information in the skit? What, if anything, should be added or deleted?
3. Did you learn anything from the skit? Do you think others will?

Keeping class comments in mind, groups revise their skits for presentation to other classes and parents.

Variation or Supplementary Activity:

Students can make public transportation ALERT buttons based on what they learned in the activity, to wear themselves and to give to friends.

SUPPLEMENTARY ACTIVITY

Activity #37 which follows suggests quiz questions you can use after teaching one or more of the mini-units or individual activities.

ACTIVITY #37

Supplementary Activity Approximate Class Time: ½-1 period

Capsule Activity Description: Students answer questions on public transportation.

Objective:

To evaluate what information students have learned during their study of public transportation.

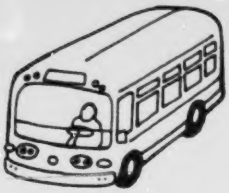
ACTIVITY

A series of questions on public transportation follows. You will want to choose only those questions which treat aspects of pubic transportation which your students have studied.

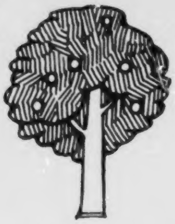
These quiz questions can be used to evaluate a mini-unit or to supplement the evaluation methods included in the activities.

Let's Travel

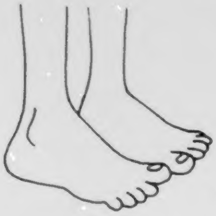
1. Draw a circle around all the pictures that show ways people travel.



Bus

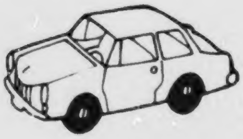


Trees

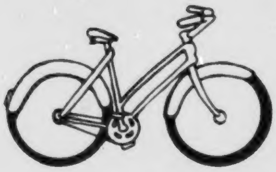


Feet

Car



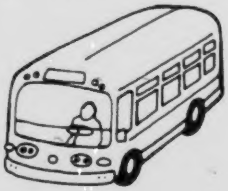
Bicycle



2. Read the names of things used for travel.

Car
Truck
Train
Bus
Horse
Boat
Feet
Airplane
Subway

Write the right name under each thing used for travel.



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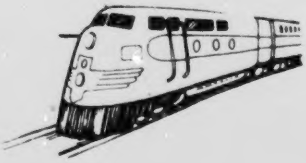

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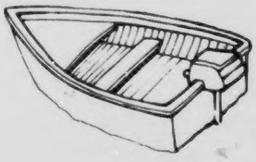

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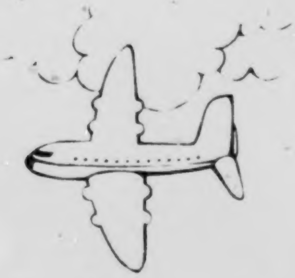

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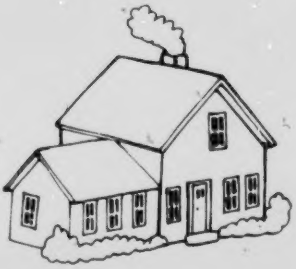

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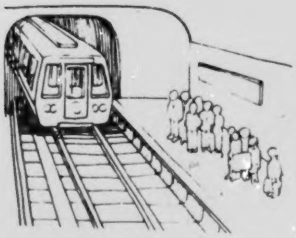


____

3. Fill in the blank with the right word.

Words to use:
Car
Bus
Subway
Ferry
Taxi
Airplane
Feet
Train

What am I?

1. I travel on water. I can carry many cars. ________________

2. I run on a track in the city. I run underground. I carry people to work. ________________

3. I have big wheels. I can carry many people. Sometimes kids ride me to get to school. ________________

4. I look like a car. I am called something else. ________________

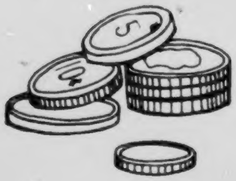
5. People use me all the time. You have two of me. ________________

6. I fly in the air. I carry many people. ________________

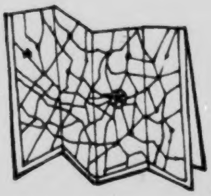
7. I have four tires and a horn. You see me every day. ________________

8. I run on a long track. I go from city to city. I am very big and very strong. ________________

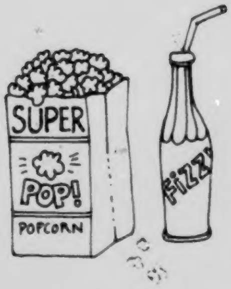
4. Draw a circle around the pictures of the things you need to ride on a bus.



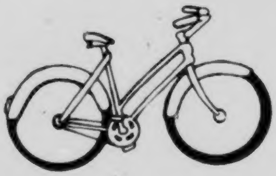
Coins



Route map



Bag of popcorn and soda pop



Bicycle

5. Draw a picture of the best kind of transportation for you and your family for going to school, to work, and shopping.

Answers

1. Bus, feet, car, bicycle

2. -----------

3. 1-Ferry
   2-Subway
   3-Bus
   4-Taxi
   5-Feet
   6-Airplane
   7-Car
   8-Train

4. Coins, Route map, Bicycle

5. ----------

GLOSSARY

Articulated bus is two buses joined together to allow a shorter turning radius on city streets. It needs only one driver and can carry 70 people. These buses have been used in Europe for a number of years, but they are just now being added to the American public transportation network.

Cable car is a railway vehicle which operates in street traffic. It is propelled by moving cables located below the street surface and powered by engines or motors at a central location not on board the vehicle.

Demand responsive vehicle is relatively new in American transportation. It has the features of a taxi and a bus and usually looks like a van. People call for service like they do for a taxi, but they pay lower fares and may ride with several other people going to a similar destination.

Double decker bus is a rubber-tired self-propelled vehicle which has two levels, enabling it to carry twice as many passengers. It has been used extensively in Europe, and is now being reintroduced to American public transportation.

Heavy rail (subway/elevated) is a subway-type railway vehicle constructed on high level platform stations.

Hydrofoil is a boat which travels on the surface of the water rather than in the water. This enables it to move much faster than ordinary boats.

Light rail (trolley) is the term usually given to the streetcar-type railway vehicle. Light rail is constructed and operates on city streets.

Public transportation refers to all modes of travel which operate within a community (as opposed to modes operating between cities and town) and which involve vehicles which are publicly owned (e.g., by the government) or owned by private businesses (e.g., a taxi company) (as opposed to vehicles which are owned by private citizens, including automobiles, bicycles, and recreational vehicles). Public transportation also also includes the facilities (e.g., bus stop shelters and ferry docks) which serve public transportation vehicles and passengers.

BIBLIOGRAPHY

BIBLIOGRAPHY

The bibliography contains educational materials for classroom use and for use by teachers in developing relevant units of study on public transportation. It consists of selected

- Materials for teachers
- Additional background materials for teachers
- Materials for students
- Periodicals

The individual entries in the materials for teachers section are presented in the following format:

**	*Title of Work*, author, date of publication. Number of pages or list of materials. Price.
Type of Material	Description of material with evaluation of material's quality and relevance for transportation consumer education.
	Source from which material may be obtained.*

For purposes of convenience, the teacher materials have been rated by the designation of stars next to the material description. (See sample above.) The stars represent the authors' evaluation based on the following scale:

No stars:	material is useful, but fair
(*) One star:	material is good
(**) Two stars:	material is very good
(***) Three stars:	material is excellent

It should be kept in mind that these evaluations are an estimation of the material's quality and relevance.** As such, the absence of a teaching material or a low rating does not *per se* indicate the material is poor. It may be excellent, but simply not relevant to the

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*Allow ten weeks for delivery of items ordered from the U.S. Government Printing Office.

**A complete discussion of the criteria used to evaluate the materials may be found on pages 448 and 449.

Manual's content. In addition, any absences may be due to the authors' oversight.

At the end of the Manual is a list of government agencies which can be contacted for further information about public transportation.

Materials for Teachers

** *Transportation: World of Work Project.* (no date) 33 pages. Price available upon request.

Guide Unique guide organized around four concepts: "There are many ways to travel," "The bus driver is an important public servant," "The cab driver is an important public servant," and "The truck driver has an important job." For each concept, resources and classroom activities are suggested. The activities are creative, but with a few exceptions, not detailed. An entire game around traveling by bus is included along with a paper game "board" and play money. Although designed for grade 4, guide can be used with grades 2-6.

Utah State Department of Public Instruction
Vocational Education Division
Occupational Education Program for Children
136 East South Temple
Salt Lake City, Utah

*** *The Voice of the Transportation Consumer: Executive Summary,* 1975. 108 pages. $5.25.

Pamphlet /Report This is a comprehensive and forthright "Report to the Secretary of Transportation on Nationwide Consumer Public Hearings Conducted by the (Department of Transportation) Office of Consumer Affairs during 1971-1974. Presents in summary but highly readable fashion the results of 54 hearings conducted in 34 cities and towns. The report analyzes 1,280 complete questionnaires received at the hearings. The report covers all aspects of transportation, but indirectly treats public transportation. A full report of the hearing results is also available and runs to 656 pages.

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22151
Catalog No. PB 241764

*** *Improving Urban Mobility,* 1975. 30 pages. Free.

Pamphlet Highly creative discussion of ways in which bus service can be improved by manipulating the traffic environment and bus system. Discussion focuses on special bus lanes and streets, improved traffic management, improved scheduling and routing, improved fare collection methods, and alternate vehicle types.

Federal Highway Administration
Urban Planning Division
Transit and Traffic Engineering Branch
Washington, D.C. 20590

** *Access for All: Transportation and Urban Growth*, 1975.
176 pages. $2.45, paperback.

Book

Stimulating discussion of how transportation availability influences residential, work, and recreational patterns. Thesis is that the introduction of the automobile has resulted in unequal access to transportation in America. Full of revealing insights into the nature of public transportation, but some readers may find some of the reading "heavy" and the illustrations (e.g., Boston) parochial.

Penguin Books
7110 Ambassador Road
Baltimore, Maryland 21207
or local bookstore

* *Transportation and the Rural Community, 1974.* 19 pages.

Pamphlet /Report

Summary of conference on rural transportation. Report treats present state of rural transit, the relationship between transportation and rural development, and the potential of new technology as a solution to rural problems.

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22151

*** *Transportation Noise Pollution: Control and Abatement*, 1970.
190 pages. $6.00.

Pamphlet

Very informative, in places technical discussion of the causes of transportation noise pollution and what can be done about them. Excellent charts, graphs, and cartoons.

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22151
Stock Number N71-15557

** *Readings for the Eco-Activist*, 1972. 41 pages. Price not listed.

Bibliography

A bibliography of environmental publications of the Federal government for young persons interested in involvement in environmental problems. There are chapters on air, water, and noise pollution that include materials on transportation pollution.

Division of Information Services
Office of Library Services
U.S. Department of the Interior
Washington, D.C. 20240

*** *Neighborhood: Community Planning and Urban Issues.* Kit. $20.00.

Game Students develop planning skills and learn about community issues as they compete to build the ideal residential community. The object of the game is to achieve the ideal balance of accessibility from residential units to jobs and other public facilities using public transportation links.

Games Central
55 Wheeler Street
Cambridge, Massachusetts 02138

*** *Transportation.* Kit. $24.00.

Game This game promotes both basic math skills and an understanding of the decision-making process inherent in selecting a mode of transportation. Travelers must wrestle with time and budget limitations as they shop comparatively for different travel modes. Although the game deals with forms of travel other than public transportation, the skills learned are transferable.

Games Central
55 Wheeler Street
Cambridge, Massachusetts 02138

Additional Background Materials for Teachers

The materials are listed alphabetically by author under each public transportation topic.

Environment and Transportation

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Public Transportation Problems

Buel, Ronald A. *Dead End: The Automobile in Mass Transportation.* (Prentice-Hall, Englewood Cliffs, NJ: 1972).

Creighton, Roger L. *Urban Transportation Planning.* (University of Illinois, Chicago: 1970).

Department of Transportation. *Conference on Transportation and Human Needs in the 70's.* (Available from National Technical Information Service, Springfield, VA 22151: 1972; Catalog No. PB 224925).

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Howsan, Henry Frederick. *The Rapid Transit Railways of the World.* (Allan & Bacon, London: 1971).

Kraft, Gerald, et al. *Free Transit.* (D.C. Heath, Lexington, MA: 1970).

Levin, Melvin and Norman Abend. *Bureaucrats in Collision, Case Studies in Area Transportation Planning.* (MIT Press, Cambridge, MA: 1971).

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Sampson, Roy and Martin Farris. *Domestic Transportation: Practice, Theory and Policy,* Third Edition. (Houghton-Mifflin, Boston: 1975).

Staley, Richard A. *Trucks and Our Changing Cities.* (Local and Short-Haul Carriers National Conference, 1616 P Street, N.W., Washington, DC 20036).

Smerk, George M. (ed.). *Readings in Urban Transportation.* (Indiana University Press, Bloomington: 1968).

Stone, Tabor R. *Beyond the Automobile.* (Prentice-Hall, Englewood Cliffs, NJ: 1971).

Special Mobility Problems

Transportation Research Board. *Transit for the Poor, the Aged, and the Disadvantaged, Transportation Research Record #403.* (Washington, DC: 1972).

Materials for Students

Bloch, Marie H. *Tunnels.* (Coward-McCann, Inc., New York: 1954).

Elting, Mary. *Trains at Work.* (Harvey House, Inc., Irvington-on-Hudson: 1947).

Gray, Genevieve. *Jobs in Transportation.* (Lothrop Lee and Shepard, New York: 1973).

Hefter, Richard. *Things That Go.* (Strawberry Books, New York: 1975).

Hellman, Harold. *Transportation in the World of the Future.* (M. Evans, New York: 1974).

Hirsch, S. Carl. *Cities and People.* (Viking Press, New York: 1968).

Holman, Felice. *Slake's Limbo.* (Scribner, New York: 1974).

Lippman, Peter J. *Busy Wheels.* (Random House, New York: 1973).

Navarra, John G. *Super Trains.* (Viking Press, New York: 1976).

Scarry, Richard. *Car and Trucks and Things That Go.* (Goldman Press, New York: 1974).

Shuttleworth, Dorothy E. *Disappearing Energy: Can We End the Crisis?* (Doubleday and Co., Garden City: 1974).

Periodicals

In addition to the periodicals listed below, teachers and students can also consult in libraries the *Reader's Guide to Periodical Literature* for past articles on public transportation.

Highway and Urban Mass Transportation
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

High Speed Ground Transportation Journal
International Society for Terrain-Vehicle Systems
Box 4824, Duke Station
Durham, N.C. 27706

IRT Newsletter
Institute for Rapid Transit
Suite 508, 1612 K Street, N.W.
Washington, D.C. 20006

Mass Transit
538 National Press Building
Washington, D.C. 20045

Transit Journal
The American Public Transit Association
1100 Seventeenth Street, N.W.
Washington, D.C. 20036

Transpo Topics for Consumers
Department of Transportation
Office of the Secretary
Washington, D.C. 20590

Transportation U.S.A.
U.S. Department of Transportation
Office of Public Affairs
400 Seventh and D Streets, S.W.
Washington, D.C. 20590

TRANSPORTATION
AND
THE ENVIRONMENT

WHY TEACH ABOUT TRANSPORTATION AND THE ENVIRONMENT*

The Problems

American consumers are the purchasers and users of personal transportation goods and services amounting to nearly 124 billion dollars every year.

Transportation and the environment are in many respects in a state of conflict. Transportation vehicles and facilities cause damage to the environment. The motor vehicle is still a major pollutant of our air, even with improvements in the control of auto emissions. Heavy traffic congestion clogs roads and city streets (77 percent of the nation's workforce commutes to work every day by private automobile; more than 70 percent of these people drive alone). Eighteen percent of the nation's energy supply is consumed by motor vehicle transportation; and nearly 80 percent of this amount is for personal travel by car, truck, or bus. (Early 1976 figures indicated an increase in vehicle fuel consumption, reverting to patterns that had been prevalent before 1974 and 1975 when Americans reduced fuel consumption in response to the immediate fuel crisis.) Motor vehicle use is responsible for much of the visual pollution of our countryside--billboards, litter, automobile junkyards--as well as many badly designed gas stations, parking lots, and bus stations.

Transportation vehicles and facilities also enhance or preserve the environment in numerous ways and make scenic areas more accessible to the public. These beneficial effects must be balanced against the damage transportation causes to the environment.

It must be remembered that the environment, in turn, can interfere with transportation, e.g., natural obstructions to visibility, confusing traffic signs, and poorly designed roads are obstacles that hamper travel safety, comfort, and convenience.

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*For the purpose of this Manual, we have defined "environment" broadly to include a wide variety of factors that interact with travel, including natural resources, residential patterns, land space, and visual obstructions. The concept includes both the natural environment and the man-made environment.

We must work to bring transportation and the environment into balance with one another by shifting emphasis from environmentally damaging forms of transportation to modes of travel which do not harm the environment unnecessarily.

The Solutions

Federal and state governments can promote balanced transportation by providing assistance for planning, development, and financing of improved transportation systems; to enact legislation which will lessen conflicts between transportation and the environment; and encourage private industry to develop and promote vehicles that are more energy-efficient and less polluting. Local transit authorities can generate greater use of their services by making public transportation more accessible and attractive to the daily traveler.

Citizens/consumers must become informed about national and local transportation and environmental problems and participate in their solution by individual personal actions and by community involvement.

Teachers can guide students to a better understanding of the causes and effects of transportation and environmental problems, and of possible solutions. Transportation consumer education can offer the student a unique opportunity to develop awareness and skills essential to acquire responsible transportation and environmental habits and to play a role in balancing the often conflicting needs of transportation and the environment in the community.

This chapter focuses on developing consumer skills that are particularly appropriate to students in Grades K-3. The learning activities are designed to

- Stimulate students' awareness and understanding of transportation and environmental issues
- Establish the concept that transportation vehicles and facilities have both good and bad effects on the environment

Mini-unit 12

Transportation and its effects on the environment

Activity #	*Activity Description*	*Class Time (periods)**
38	Students define "transportation" and "pollution" and play a game to reinforce those concepts.	1-2
39	Students create collages and mobiles illustrating modes of transportation and transportation facilities and their effects.	1½-2
	Mini-unit 13 Discovering the environmental effects of transportation	
40	Students define "transportation" and "pollution" and play a game to reinforce those concepts.	1-2
41	Students identify noises associated with vehicles and transportation facilities.	1-2
42	Students listen to songs about transportation's effects on the environment.	1-1½
43	Students identify pollution associated with transportation.	2-3
44	Students create posters depicting the relationship between transportation vehicles and our consumption of natural resources.	1½-2
	Supplementary Activities	
45	Students engage in one or more mini-activities or science experiments on transportation's effects on the environment.	½-2
46	Students answer questions on transportation and the environment.	½-1

*Assumes class period of 30-40 minutes.

MINI-UNITS AND LEARNING ACTIVITIES

MINI-UNIT 12

TRANSPORTATION AND ITS EFFECTS ON THE ENVIRONMENT

This mini-unit begins with a discussion of transportation, what it is and how it helps us, and how it affects our environment. The class then plays a matching game which demonstrates the benefits and environmental problems caused by various transportation vehicles. In the following activity, students make collages and mobiles to reinforce their understanding of transportation's involvement with the environment. To supplement this unit you might also consider adding a mini-activity found in Activity #45 (Supplementary Activities) at the end of this chapter. This activity provides short exercises clarifying and reinforcing students' understanding of transportation's effects on the environment.

This unit may be logically followed by Mini-unit 13, "Discovering the Environment Effects of Transportation."

Note: Activity #38 in this unit is used again in Mini-unit 13 as Activity #40 because it is especially helpful in introducing the concepts of transportation and environment. If, however, you follow Mini-unit 12 with Mini-unit 13, you should not need to repeat this introductory activity.

MINI-UNIT 12 LESSON PLAN

Transportation and its effects on the environment

Activity #	*Activities*	*Class Time*
38[a]	DESCRIPTION: Students define transportation and pollution and play a game to reinforce these concepts.[a] OBJECTIVE: By the end of the activity, students will be able to name one beneficial and one harmful effect of at least two modes of transportation.	1-2 periods
39	DESCRIPTION: Students create collages and mobiles illustrating modes of transportation and transportation facilities and their effects. OBJECTIVE: After completing this activity, students will be able to demonstrate knowledge of transportation's effects on the environment by naming at least two modes of transportation and one transportation facility and one beneficial or harmful effect.	1½-2 periods

Total Class Time: 2½-4 periods.

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[a] This activity also appears in Mini-unit 13 as Activity #40.

ACTIVITY #38

Mini-unit Topic: Transportation and its Effects on the Environment   Approximate Class Time: 1-2 periods

Capsule Activity Description: Students define "transportation" and "pollution" and play a game to reinforce these concepts.*

Objective:
By the end of the activity students will be able to name one beneficial and one harmful effect of at least two modes of transportation.

Concepts Treated:
- There are many forms of transportation.
- Transportation has both beneficial and harmful effects on the environment.

Materials Needed:
Game cards.

ACTIVITY

Ask students for their definition of transportation by asking them some questions. For example:

- How did you get to school this morning?
- How do your parents go to work?
- How do your mothers and fathers get the groceries home from the supermarket?
- What does a pilot do?
- Where do sailors work?
- What is used to pick up garbage?
- How does food get from the farm to the grocery store?
- When people move how do their belongings get to their new house?

---

*This activity also appears in Mini-unit 13 as Activity #40.

As the answers are called out write them on the chalkboard. Ask students if they know what all those things have in common with each other (for example, ways to travel, things that move, space to carry things).

Now discuss with the class the meaning of the concept environment. Explain that the environment is composed of all our physical surroundings. It includes the air we breathe, the water we drink, the noise we hear, the things we feel and see. Transportation vehicles and facilities are part of the environment. They influence the way we live and they are in turn influenced by other parts of the environment.

Next hold up several pictures of different transportation vehicles like those at the end of the activity or some you have collected yourself. As you hold up the illustrations, ask students to name each vehicle.

Discuss with the class what good things each of these vehicles does for us.* For example,

- Bicycle: Recreation and trips to school and work
- Truck: Picks up garbage
- Bus: Takes mommy and many other people to work
- Helicopter: Spots forest fires
- Plane: Carries people long distances
- Snowmobile: Helps people have fun
- Train: Carries food from farm to city
- Car: Takes your family to visit relatives

Then ask the class if these vehicles are ever bad for us. It should be pointed out that some modes of travel do not harm the environment, for example, bicycling and walking. After students have discussed how transportation vehicles can harm us, briefly explain the four major categories of pollution giving examples of each.

> Car, truck and plane exhaust can harm our health and the health of animals. This is called air pollution.
>
> Planes and trains can make it hard to sleep and think. This is called noise pollution.
>
> Boats can cause the water to become dirty because they can leak oil and gas. This is called water pollution.
>
> Parking lots, billboards, and gas stations can sometimes be ugly. This is called visual pollution.

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*You might want to consult the Readings at the end of this chapter for additional information on this topic.

This preliminary discussion will give students needed background for the game which follows.

To play the game, divide the class into two or more teams. Each team lines up or stands so that all students can observe the game at all times. Place the pictures of the transportation vehicles around the room. First, show the class the smaller cards of the four different kinds of pollution, noting the causes of each. (Cards are on page 373-379.)

Litter (visual pollution): People in cars, trucks, buses, snowmobiles

Oil (water pollution): Boat spills

Noise: Trucks, planes, cars, trains, snowmobiles

Air: Cars, trucks, planes, buses

Second, explain the other four (positive effects) cards: jobs, fun, moving, and work and school.

Jobs: Cars, trucks, buses, planes, and all other forms of transportation provide jobs for people.

Fun: Cars, snowmobiles, motorboats, bicycles can help people have fun and enjoy themselves.

Moving: Trucks and cars can help people move their belongings and other things.

Work and school: Cars, buses, and sometimes bicycles help get people to work and school and many other places they want to go.

Start the game by selecting a member from one of the teams. Give him or her one of the cards to match up with one of the transportation vehicles around the room. The student places the card over the picture of the vehicle which causes the illustrated effect. If the student is incorrect he or she takes his or her seat and the next student on the same team may try. In each round* as many different vehicles as possible should have cards placed over them.

The team left with the most members still standing at the end of the alloted time or after a set number of rounds is the winner.

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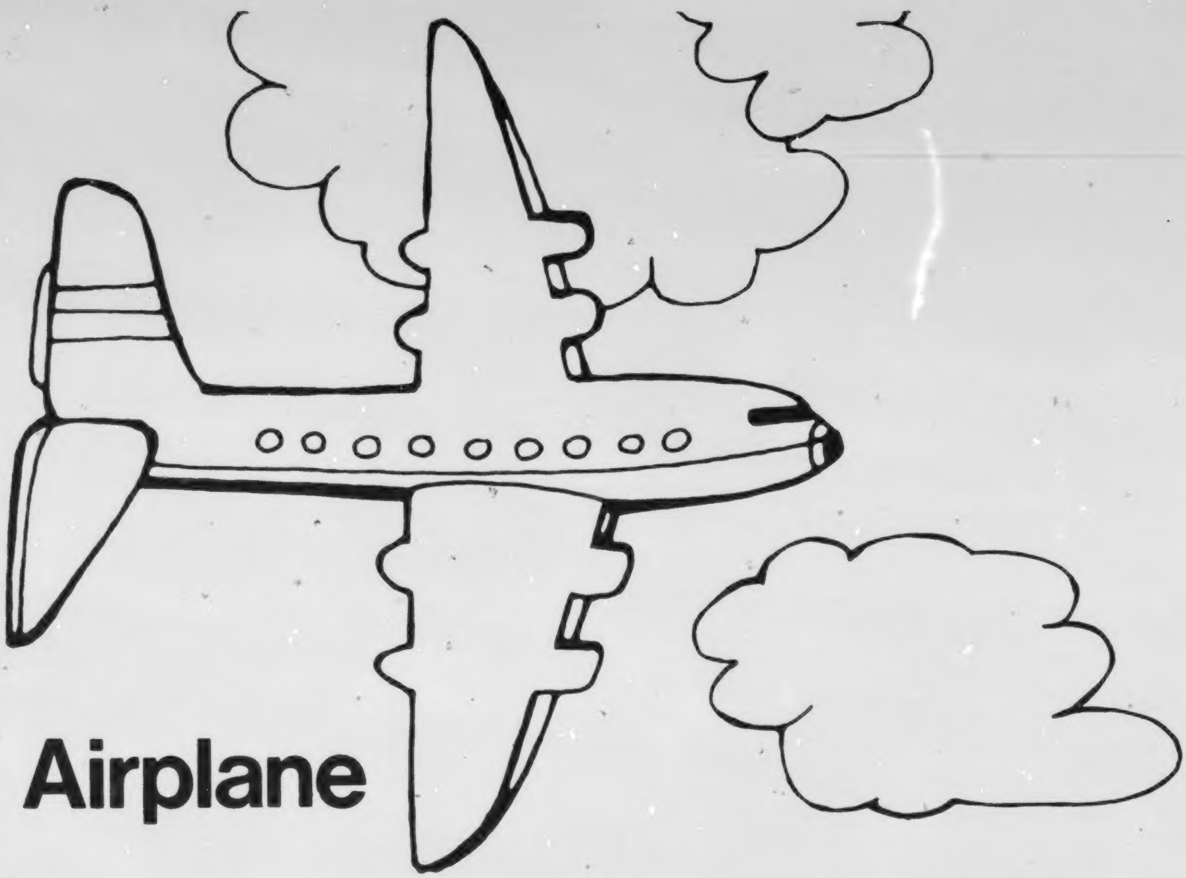
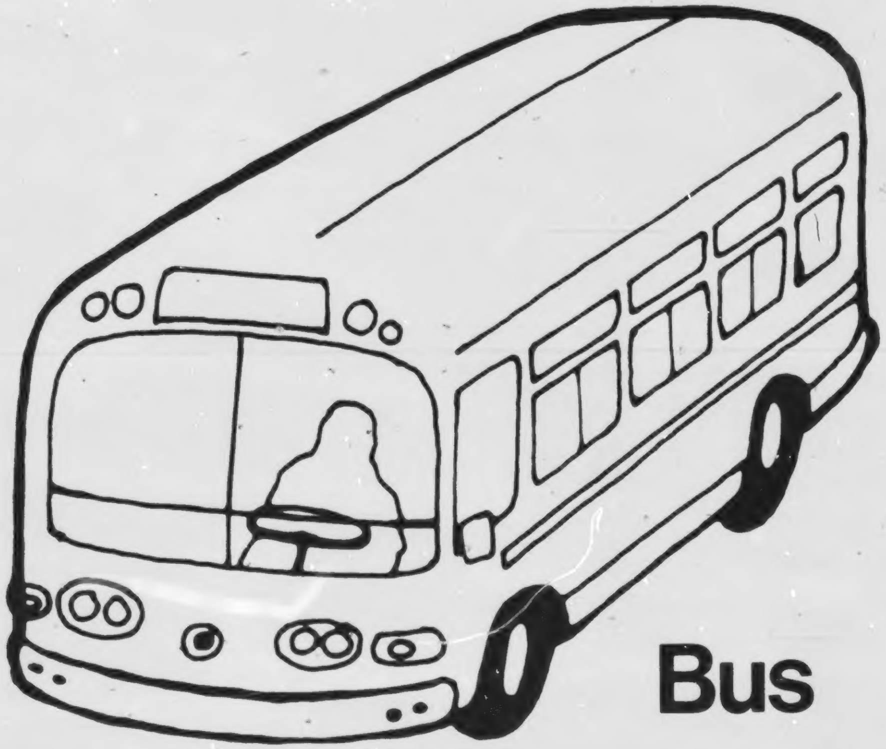
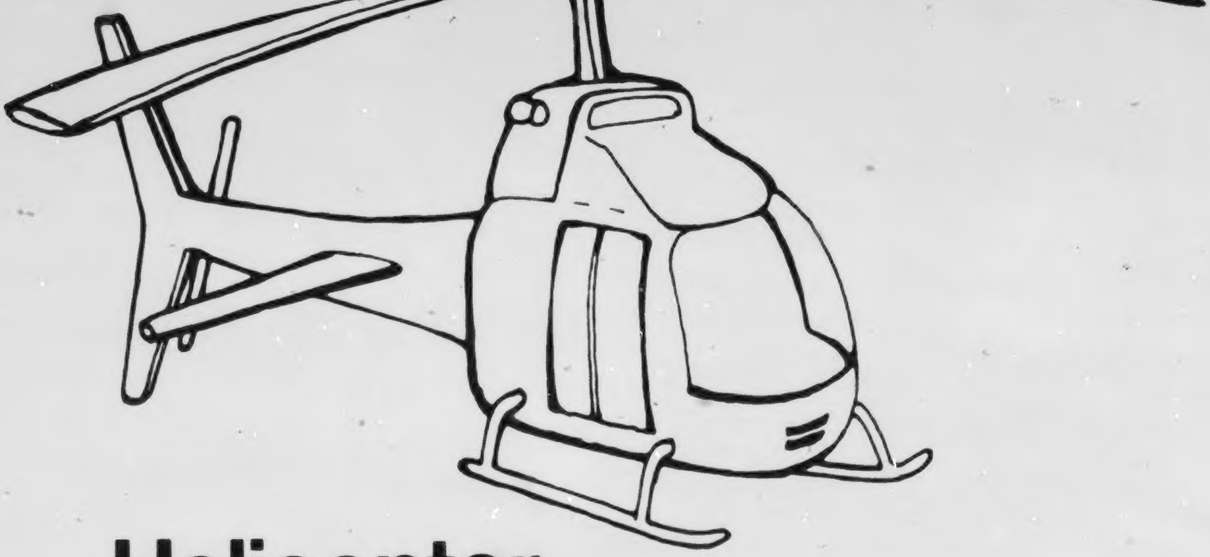
*A round is the playing out of all 16 (2 sets) of the pollution/positive effect cards.



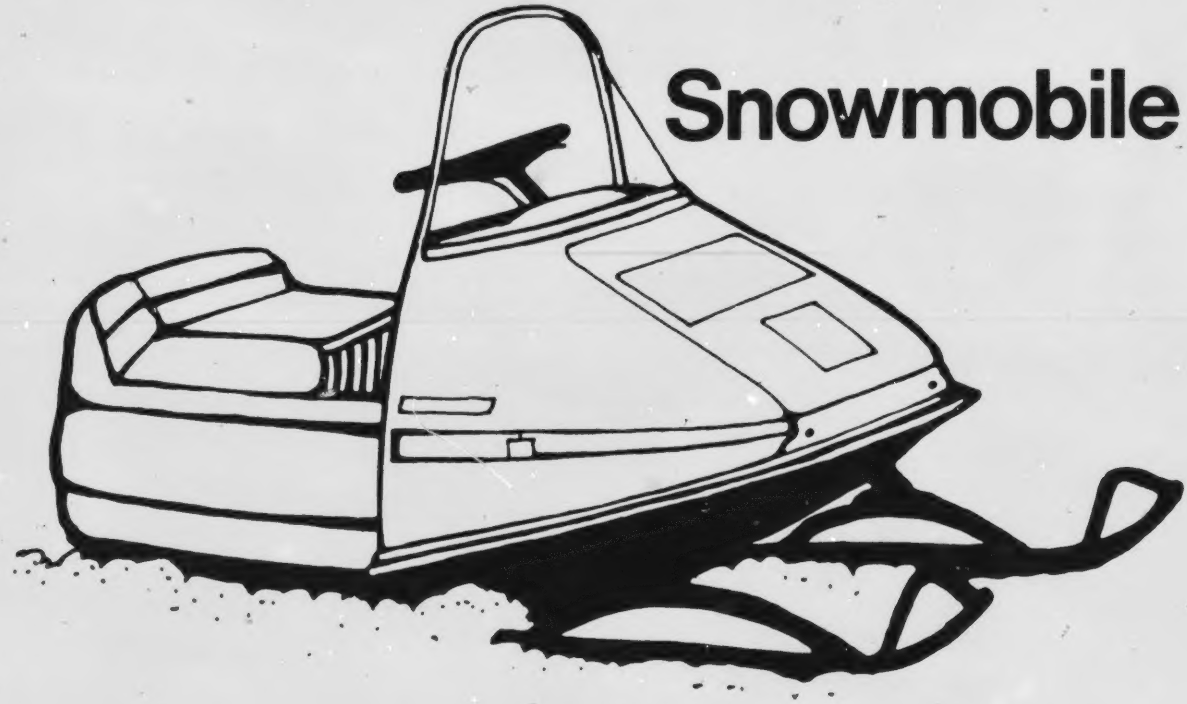
Airplane



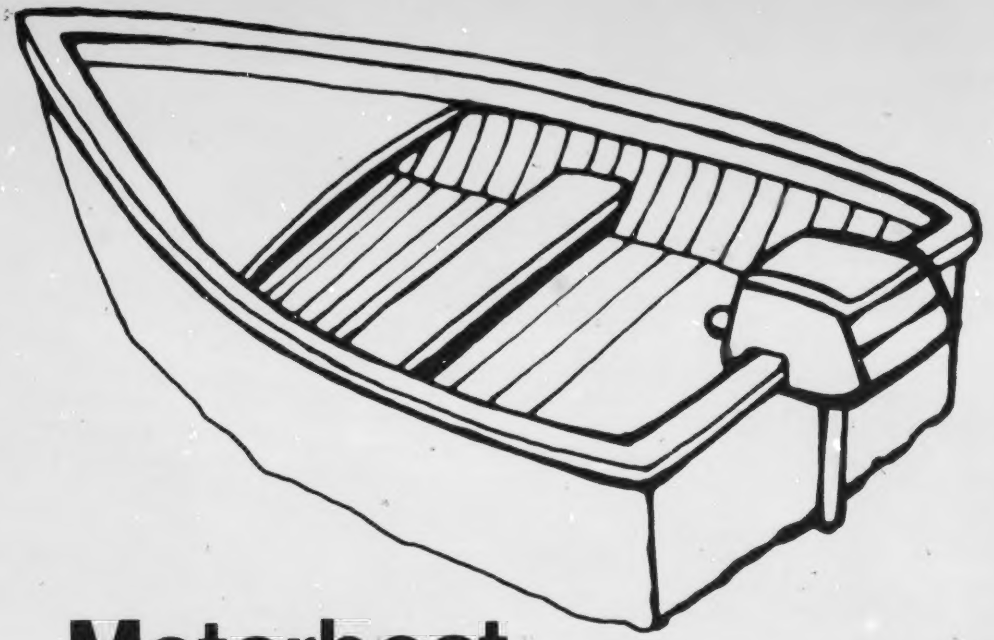
Bus



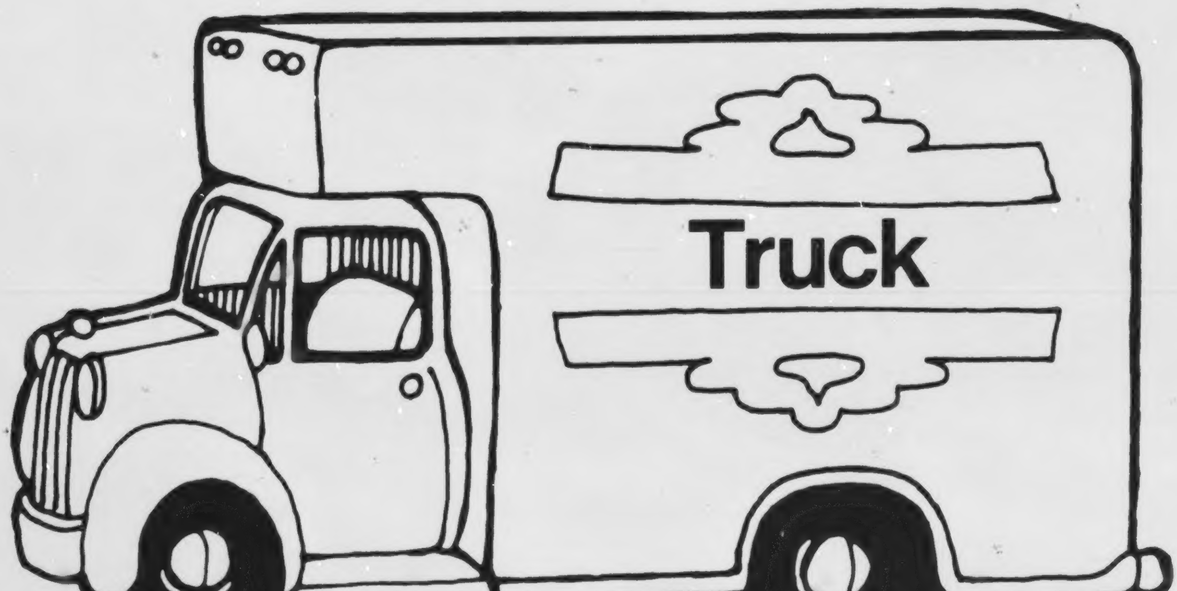
Helicopter

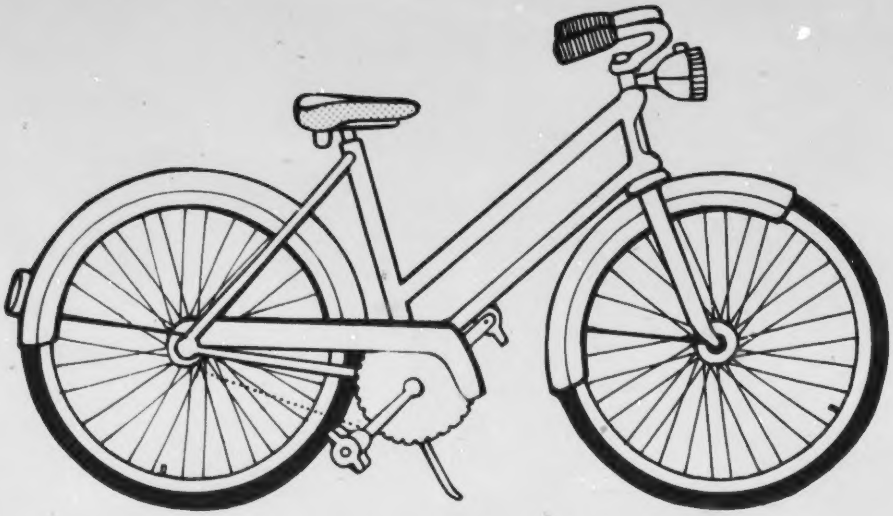


Snowmobile

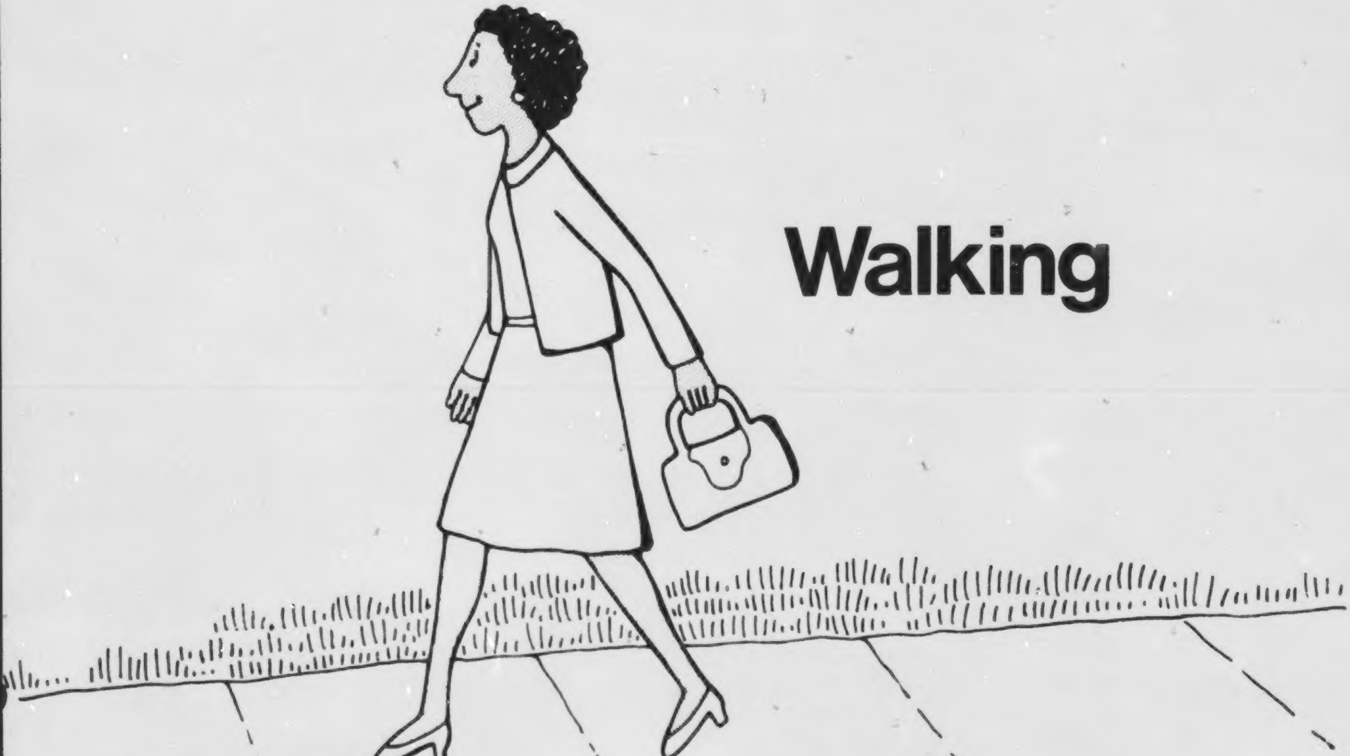


Motorboat

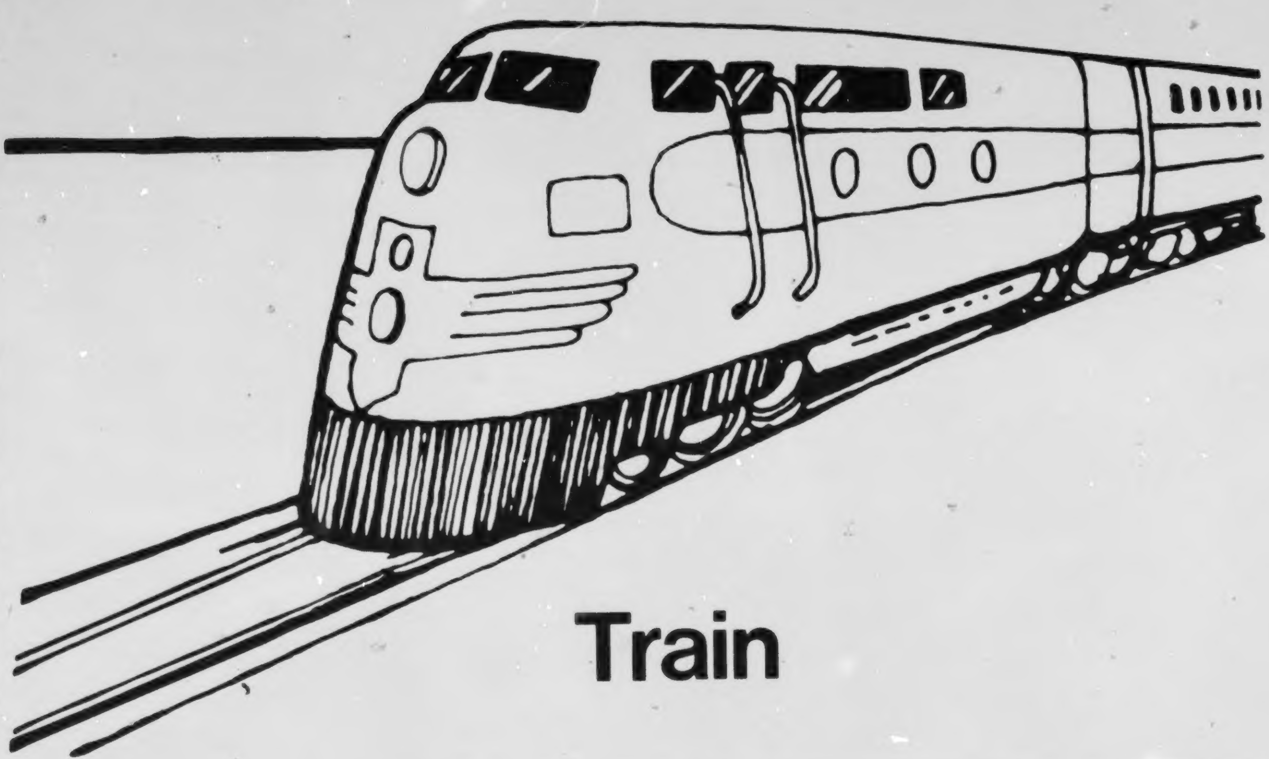




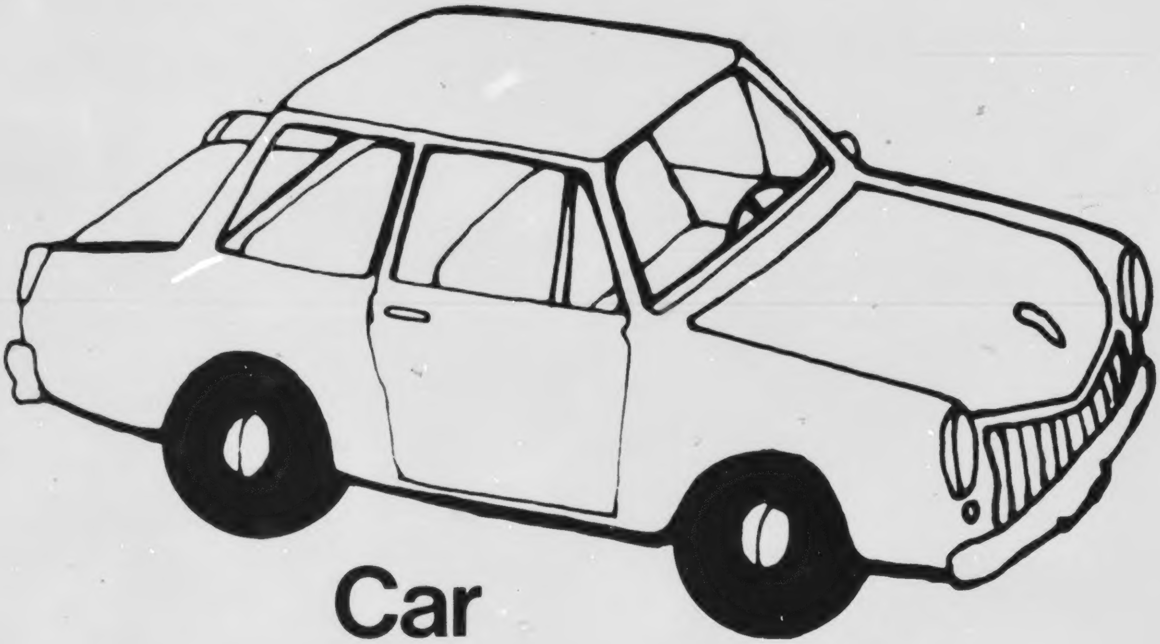
Bicycle



Walking

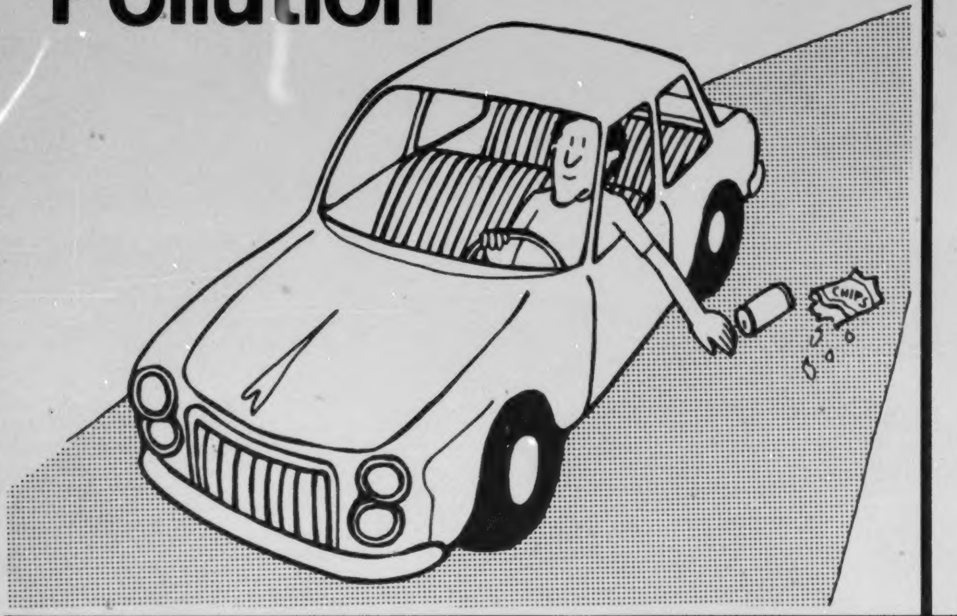


Train

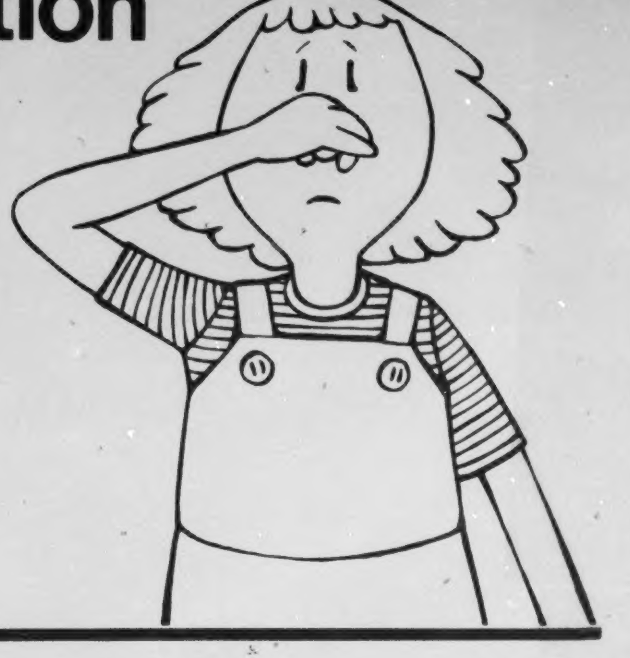


Car

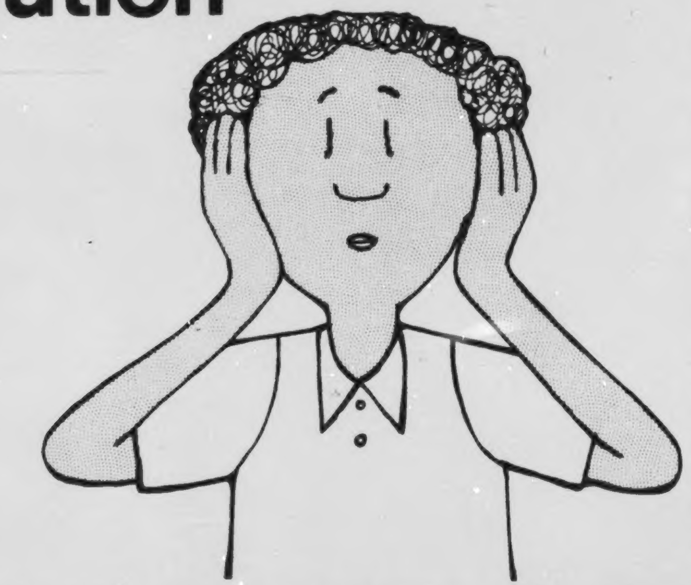
Pollution



Pollution



Pollution



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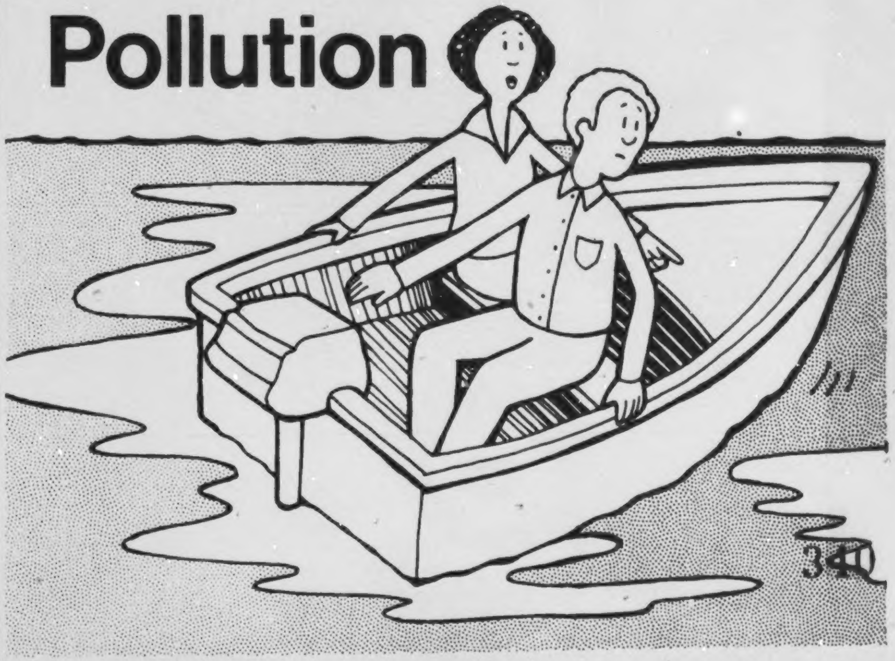
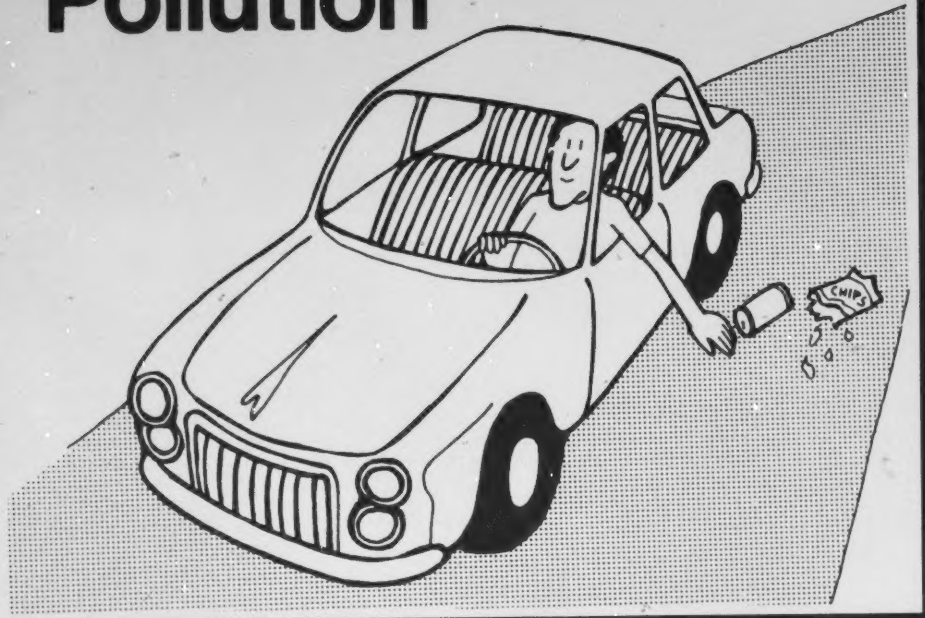
Pollution

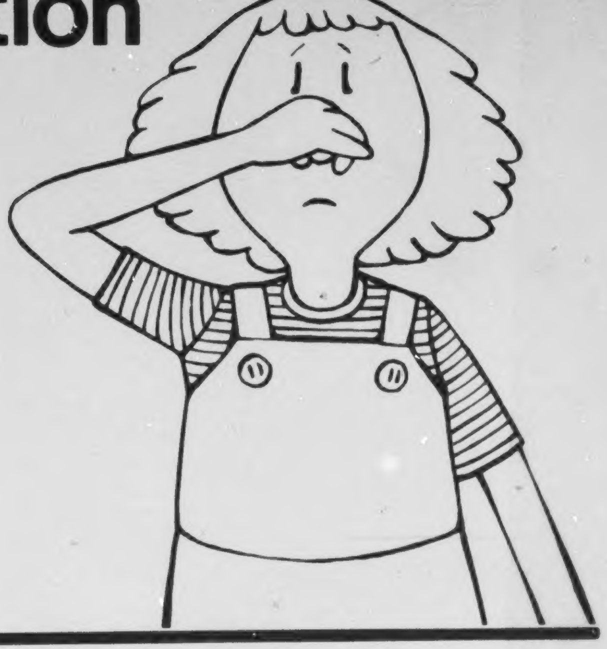


340

Pollution



Pollution



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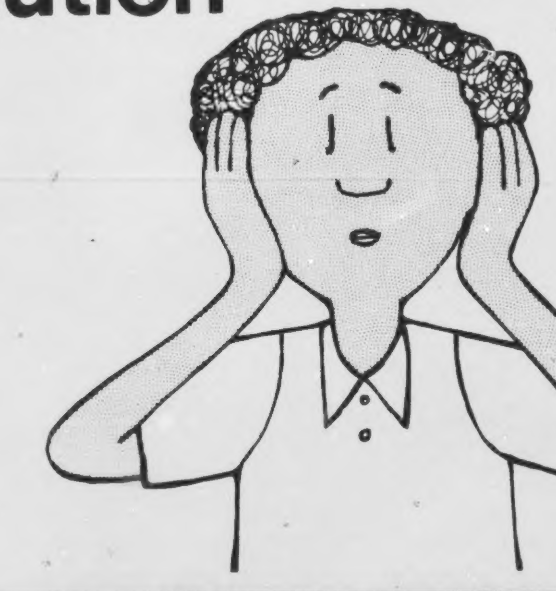

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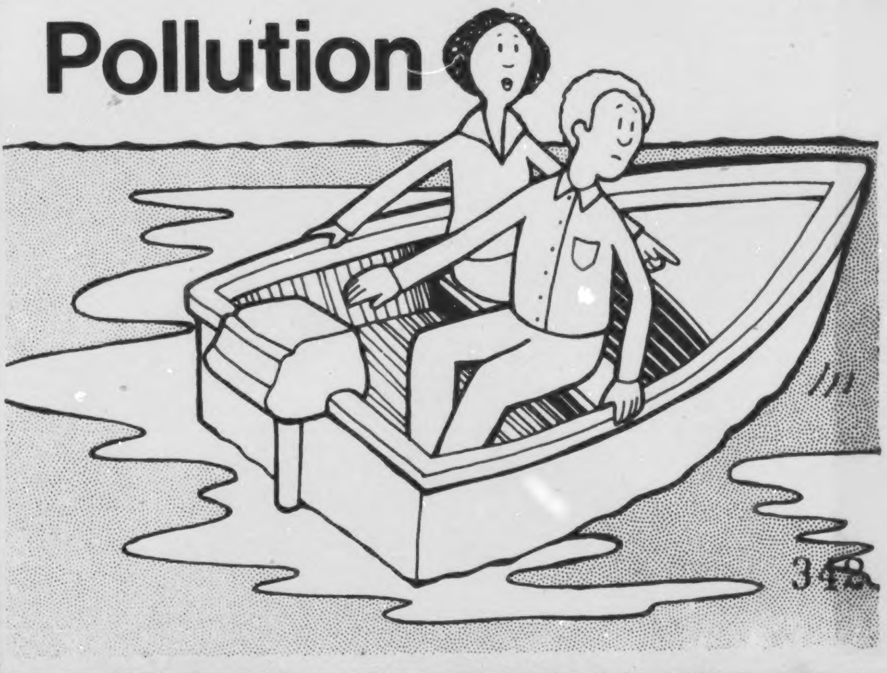
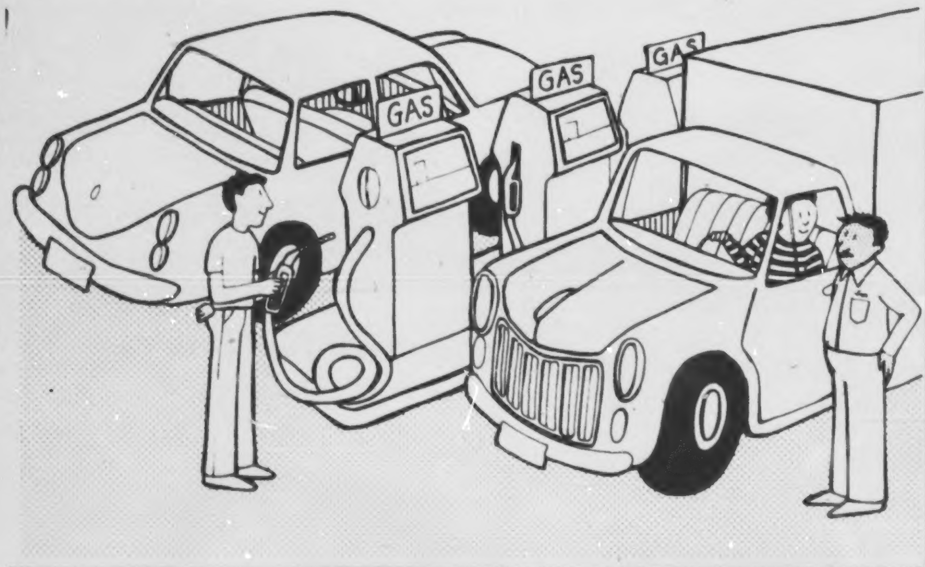
Pollution

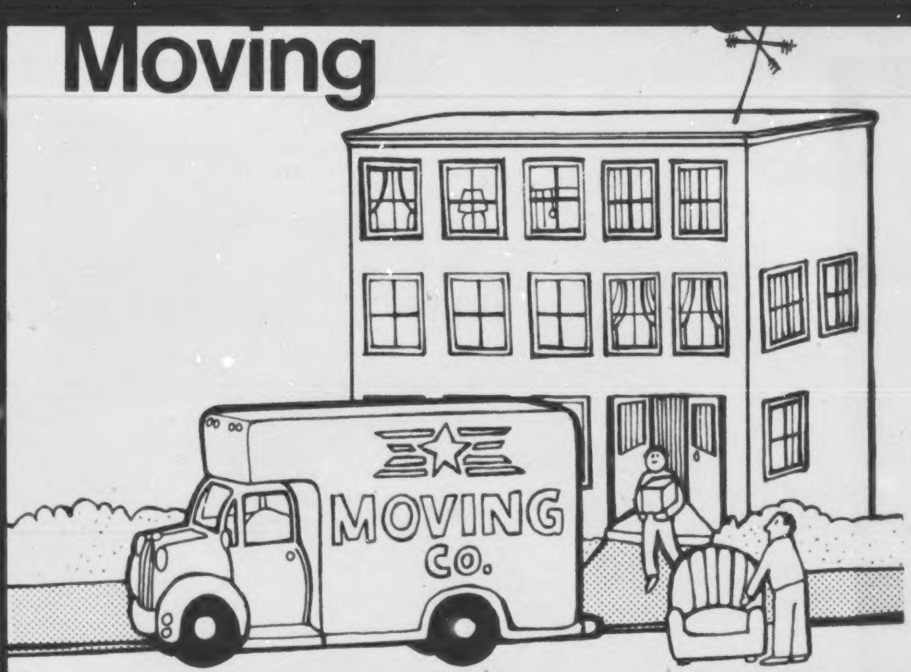


342

Jobs

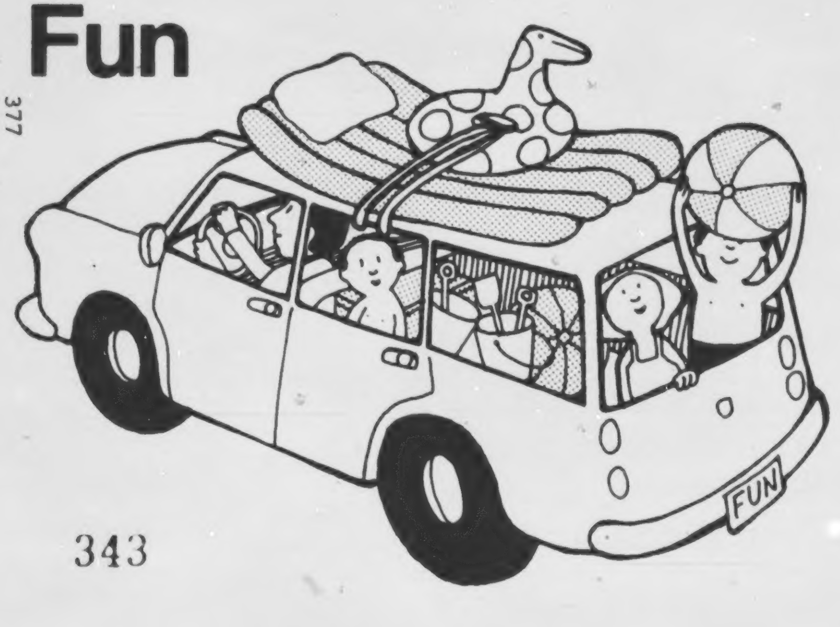


Moving



Fun

377



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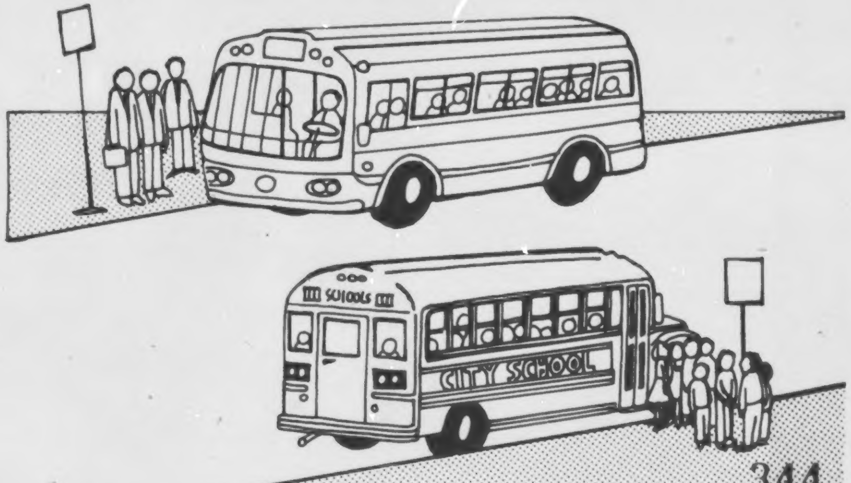
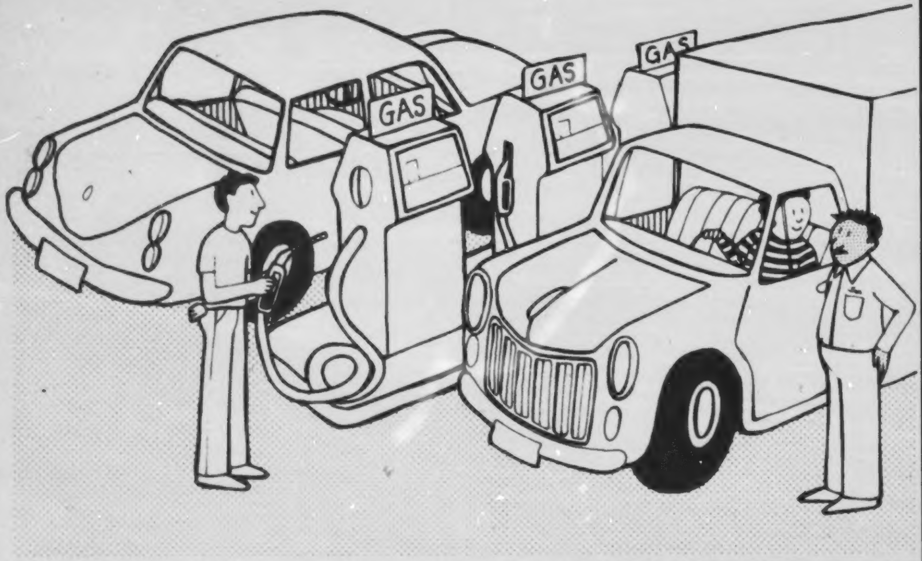
Work and School


SCHOOLS
CITY SCHOOL

344

Jobs


GAS
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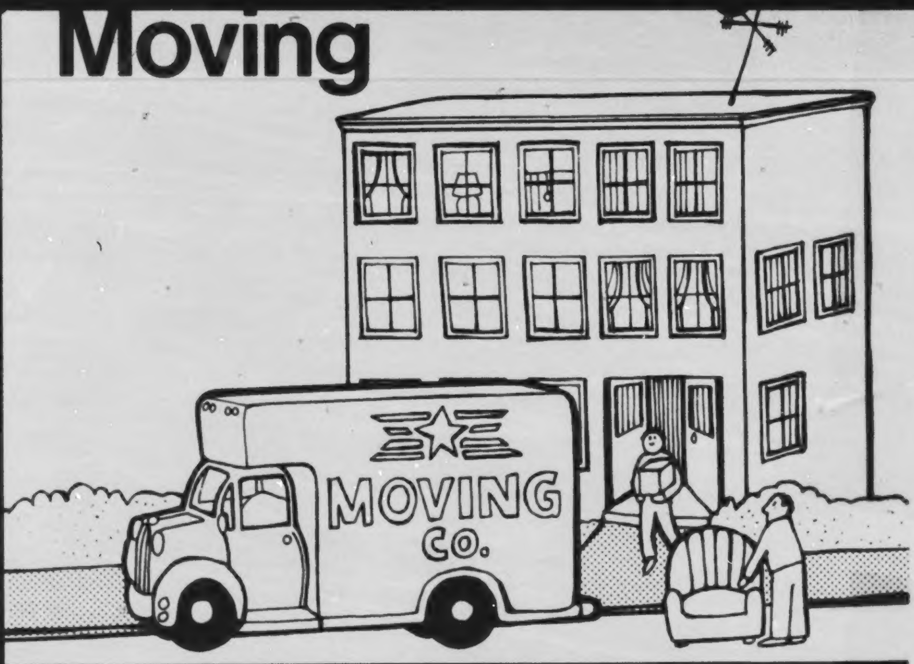
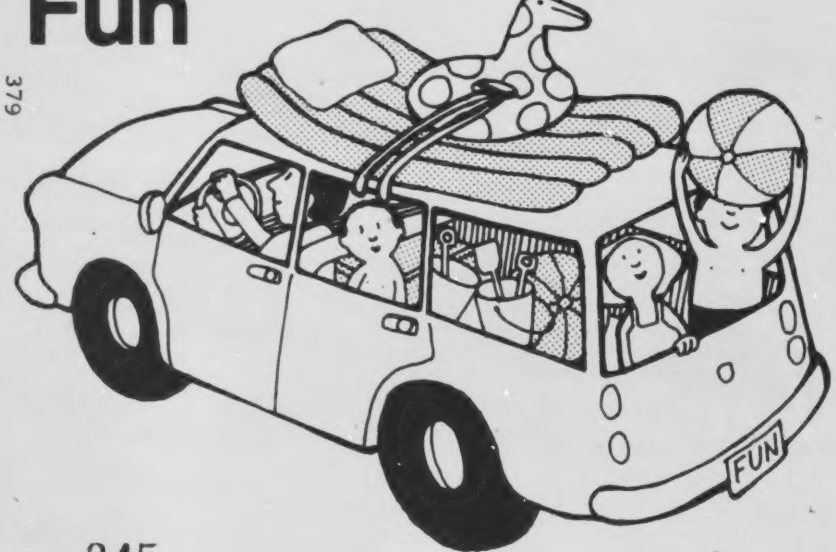
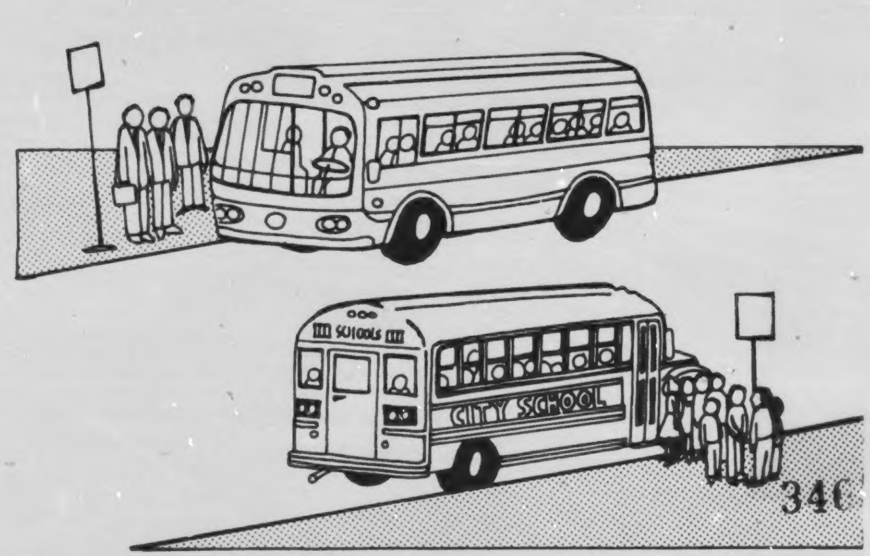
Moving



Fun



Work and School


SCHOOLS
CITY SCHOOL

ACTIVITY #39

Mini-unit Topic: Transportation and its Effects on the Environment

Approximate Class Time: 1½-2 periods

Capsule Activity Description: Students create collages and mobiles illustrating modes of transportation and transportation facilities and their effects.

Objective:
After completing this activity students will be able to demonstrate knowledge of transportation's effects on the environment by naming at least two modes of transportation and one transportation facility and one beneficial or harmful effect of each.

Concept Treated:

- Transportation vehicles and facilities have both beneficial and harmful effects on the environment.

Materials Needed:
Magazines, newspapers, construction paper, scissors, crayon, string.

ACTIVITY

To make collages or mobiles students cut pictures out of magazines or newspapers or draw their own pictures of transportation vehicles and facilities. Pictures depicting various forms of pollution should also be collected. If pictures actually depicting pollution cannot be found, pictures of the following can be used to illustrate the problem: cans, garbage, signs, billboards, junk, water, lakes, ponds, smoke, exhaust, hearing aids, and parking lots.

Suggestions for pictures illustrating the beneficial aspects of transportation are: fire fighting, shipping goods, people traveling, kids on a school bus, and people working at transportation jobs (e.g., pilots, bus drivers, gas station attendants.

The collages and mobiles can be put together in several ways. Projects can depict different modes of transportation, different transportation facilities, different forms of pollution caused by transportation, or the beneficial effects of transportation.

When the projects are completed, individual collages can be put together on the bulletin board to form one large collage. Mobiles are hung from the ceiling. Letters are cut from newspapers to form the names of the various transportation vehicles and facilities, and the general kinds of pollution illustrated are posted alongside the bulletin board or hung from the mobiles.

The class then discusses the collages and mobiles and decides what each one illustrates and whether or not it is or can be beneficial or harmful to society.

MINI-UNIT 13

DISCOVERING THE ENVIRONMENTAL EFFECTS OF TRANSPORTATION

Once students have acquired a working knowledge of the basic concepts associated with transportation and the environment, they can move on to develop skills that will enable them to recognize transportation problems in their own community and neighborhood. The activities in this unit require students to identify street sounds, to note those that are associated with transportation, and to indicate those which are pleasant and annoying. Then using records or tape recordings, students become familiar with other kinds of environmental pollution. Students look around their community and neighborhood for examples of pollution caused by transportation vehicles and facilities. Finally, students make posters depicting the relationship of transportation vehicles to our use of natural resources.

Specific concepts dealt with in this unit follow:

- Transportation has both beneficial and harmful effects on the environment.
- Some noises are annoying to us as well as harmful to the environment.
- There are many different kinds of environmental pollution associated with transportation.
- Transportation affects all communities, some more than others and in different ways.

MINI-UNIT 13 LESSON PLAN

Discovering the environmental effects of transportation

Activity #	*Activities*	*Class Time*
40[a]	DESCRIPTION: Students define "transportation" and "pollution" and play a game to reinforce these concepts.[a] OBJECTIVE: By the end of the activity, students will be able to name one beneficial and one harmful effect of at least two modes of transportation.	1-2 periods
41	DESCRIPTION: Students identify noises associated with vehicles and transportation facilities. OBJECTIVE: By the end of the activity, students will be able to identify at least two annoying or harmful noises related to transportation and two sounds or noises that are beneficial or helpful to the environment and justify their evaluations.	1-2 periods
42	DESCRIPTION: Students listen to songs about transportation's effects on the environment. OBJECTIVE: At the end of the activity, students demonstrate knowledge of transportation's effects on the environment by orally describing to the class their drawings (done in the activity) and the environmental effects they illustrate.	1-1½ periods
43 Spirit Master #10	DESCRIPTION: Students identify pollution associated with transportation. OBJECTIVE: By the end of the activity, students will be able to demonstrate awareness of pollution caused by transportation by naming two kinds of pollution and at least two causes of it.	2-3 periods

[a] This activity also appears in Mini-unit 12 as Activity #38.

MINI-UNIT 13 LESSON PLAN (CONTD.)

Discovering the environmental effects of transportation

Activity #	*Activities*	*Class Time*
44	DESCRIPTION: Students create posters depicting the relationship between transportation vehicles and our consumption of natural resources. OBJECTIVE: After completing this activity students will be able to identify the natural resource required to power three different vehicles.	1½-2 periods

Total Class
Time: 6½-10½
periods.

ACTIVITY #40

Mini-unit Topic: Discovering the Environmental Effects of Transportation

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students define "transportation" and "pollution" and play a game to reinforce these concepts.*

Objective:

By the end of the activity students will be able to name one beneficial and one harmful effect of at least two modes of transportation.

Concepts Treated:

- There are many forms of transportation.
- Transportation has both beneficial and harmful effects on the environment.

Materials Needed:

Game cards (included with Activity #38).

ACTIVITY

Ask students for their definition of transportation by asking them some questions. For example:

- How did you get to school this morning?
- How do your parents go to work?
- How do your mothers and fathers get the groceries home from the supermarket?
- What does a pilot do?
- Where do sailors work?
- What is used to pick up garbage?

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*This activity also appears in Mini-unit 12 as Activity #38.

- How does food get from the farm to the grocery store?
- When people move how do their belongings get to their new house?

As the answers are called out write them on the chalkboard. Ask students if they know what all those things have in common with each other (for example, ways to travel, things that move, space to carry things, etc.).

Now discuss with the class the meaning of the concept environment. Explain that the environment is composed of all our physical surroundings. It includes the air we breathe, the water we drink, the noise we hear, the things we feel and see. Transportation vehicles and facilities are part of the environment. They influence the way we live and they are in turn influenced by other parts of the environment.

Next hold up several pictures of different transportation vehicles like those at the end of Activity #38 or some you have collected yourself. As you hold up the illustrations, ask students to name each vehicle.

Discuss with the class what good things each of these vehicles does for us.* For example,

- Bicycle - recreation and trips
- Truck - picks up garbage
- Bus - takes mommy and many other people to work
- Helicopter - spots forest fires
- Plane - carries people long distances
- Snowmobile - helps people have fun
- Train - carries food from farm to city
- Car - takes your family to visit relatives

Then ask the class if these vehicles are ever bad for us. It should be pointed out that some modes of travel do not harm the environment, for example bicycling and walking. After students have discussed how transportation vehicles can harm us, briefly explain the four major categories of pollution giving examples of each.

> Car, truck and plane exhaust can harm our health and the health of animals. This is called air pollution.
>
> Planes and trains can make it hard to sleep and think. This is called noise pollution.

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*You might want to consult the Readings at the end of this chapter for additional information on this topic.

Boats can cause the water to become dirty because they can leak oil and gas. This is called water pollution.

Parking lots, billboards, and gas stations can sometimes be ugly. This is called visual pollution.

This preliminary discussion will give students needed background for the game which follows.

To play the game, divide the class into two or more teams. Each team lines up or stands so that all students can observe the game at all times. Place the pictures of the transportation vehicles around the room. First, show the class the smaller cards of the four different kinds of pollution, noting the causes of each. Cards may be found with Activity #38.

Litter (visual pollution): People in cars, trucks, buses, snowmobiles

Oil (water pollution): Boat spills

Noise: Trucks, planes, cars, trains, snowmobiles

Air: Cars, trucks, planes, buses

Second, explain the other four (positive effects) cards: jobs, fun, moving, and work and school. Cards may be found with Activity #38.

Jobs: Cars, trucks, buses, planes, and all other forms of transportation provide jobs for people.

Fun: Cars, snowmobiles, motorboats, bicycles can help people have fun and enjoy themselves.

Moving: Trucks and cars can help people move their belongings and other things.

Work and school: Cars, buses and sometimes bicycles help get people to work and school and many other places they want to go.

Start the game by selecting a member from one of the teams. Give him or her one of the cards to match up with one of the transportation vehicles around the room. The student places the card over the picture of the vehicle which causes the illustrated effect. If the student is incorrect, he or she takes his or her seat and the next student on the same team may try. In each round* as many different vehicles as possible should have cards placed over them.

The team left with the most members still standing at the end of the alloted time or after a set number of rounds is the winner.

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*A round is the playing out of all 16 (2 sets) of the pollution/positive effects cards.

ACTIVITY #41

Mini-unit Topic: Discovering the Environmental Effects of Transportation

Approximate Class Time: 1-2 periods

Capsule Activity Description: Students identify noises associated with vehicles and transportation facilities.

Objective:
By the end of the activity students will be able to identify at least two annoying or harmful noises related to transportation and two sounds or noises that are beneficial or helpful to the environment and justify their evaluations.

Concepts Treated:

- There are many sounds and noises associated with transportation.
- Some noises are annoying to us as well as harmful to the environment.

Materials Needed:
Flash cards are optional.

ACTIVITY

Ask students to pretend they are standing outside in the center of their city or town. What noises or sounds do they hear? Make a list on the chalkboard of the responses. Examples of transportation sounds follow. (Your students' list will most certainly contain sounds other than those made exclusively by transportation vehicles.) The list may include a car horn, squealing brakes, accident noises, a train whistle, a boat whistle, a fog horn, a plane overhead, an ice cream truck bell, construction, a police whistle, a fire engine siren, and a garbage truck.

Note: You might find it helpful to consult the Readings at the end of this chapter for background information on the "The Effect of Noise on Man and the Natural Environment."

Ask the students to cross out the sounds which are not made by transportation vehicles or things associated with transportation. You should find much of your list still intact.

Divide the class into two or more teams and situate them in various parts of the classroom but so they are visible to each other. Choose a student or ask for a volunteer from one of the teams. That student stands in front of his or her group. Give the student a flash card with the name of a transportation sound on it, or whisper a sound in his or her ear, or both. Without letting his or her teammates know the sound the student acts it out for the team to guess. If the team guesses correctly it gets two points. If the team cannot guess what it is after an appropriate amount of time has elapsed (30-60 seconds), the other team(s) can try to guess. Whichever team guesses correctly receives one point. The game proceeds from team to team until the list of sounds is exhausted or time has expired.

Students identify which sounds are necessary for public safety, convenience or pleasure, and which noises might be softened or avoided (e.g., fire and police sirens are necessary to warn nearby motorists; honking a horn is sometimes necessary and sometimes not; faulty mufflers cause cars to make more noise than necessary).

ACTIVITY #42

Mini-unit Topic: Discovering the Environmental Effects of Transportation

Approximate Class Time: 1-1½ periods

Capsule Activity Description: Students listen to songs about transportation's effects on the environment.

Objective:

At the end of the activity students demonstrate knowledge of transportation's effects on the environment by orally describing to the class their drawings (done in the activity) and the environmental effects they illustrate.

Concepts Treated:

- Transportation has varying effects on the environment.
- Transportation affects all communities, some more so than others and in different ways from others.

Materials Needed:

Records or tapes, crayons, drawing paper.

ACTIVITY

Locate records or tape recordings of songs concerning transportation's effects on the environment. Examples of songs about transportation's harmful effects include

- Cement Octopus (Pete Seeger, "God Bless the Grass," Columbia Records CS 9232
- Where do the Children Play (Cat Stevens, "Tea for the Tillerman," A&M Records, SPY 280)
- Air (from the album "Hair," RCA LSO-1150)

Play the songs for the class. Students identify harmful transportation effects on the environment referred to in the songs. List the effects students mention on the chalkboard. Discuss the causes of each effect and what might be done to prevent it. Ask the students if they have ever noticed that effect in the community or neighborhood.

Alone or in small groups students choose one or part of one of the songs played and draw a picture or mural of what they heard in the way of effects on the environment caused by transportation. Consider playing the records or tapes again while the students are creating their drawings.

ACTIVITY #43

Mini-unit Topic: Discovering the Environmental Effects of Transportation

Approximate Class Time: 2-3 periods

Capsule Activity Description: Students identify pollution associated with transportation.

Objective:
By the end of the activity students will be able to demonstrate awareness of pollution caused by transportation by naming two kinds of pollution and at least two causes of it.

Concepts Treated:

- There are different kinds of pollution.
- There are many different causes of environmental pollution associated with transportation.

Materials Needed:
Spirit Master #10, drawing paper, crayons.

ACTIVITY

Begin the activity by reviewing the four major categories of pollution (noise, air, water, visual) with your students, asking them for examples of each.

Next distribute to each student or pair of students the pollution chart found on Spirit Master #10. This chart is used by students to record their observations of pollution in their community or neighborhood. Each time students come across a cause of pollution illustrated on the chart they put a checkmark in the space below the appropriate picture.

The left hand column going down the chart indicates the kinds of pollution (ear=noise, nose=air, faucet=water, eye=visual). The columns running across the page illustrate some of the causes of the different kinds of pollution. For example, car, plane, and truck exhaust contribute to air pollution. The empty boxes may be used by students to illustrate causes of pollution they observe which do not appear on the chart.

Before proceeding with the observation sessions make sure students have a clear understanding of the chart so they will know where to record what they will be observing.

The observation sessions can take place in several ways.

- Students (alone or in pairs) can observe pollution of the environment in their own neighborhoods for one to three days. This can be done as homework.

- If students ride a bus to school, they can make their observations from that vantage point during a one to three day period on their way to and from school.

- You can take the class, together or in small groups, outside during school time over a period of from one to three days to conduct the observation sessions.

After each session, have the students report their observations. Keep a running count for each cause and kind of pollution observed on a master pollution chart on the chalkboard or bulletin board. Discuss several of the causes observed with your students. You might focus your discussion around the following questions and issues.

- Do you think there is much pollution in our community caused by __________ (car exhaust, road construction, billboards, etc.)?

- Is some pollution of a temporary nature and is some pollution necessary to make things better in the long run? (e.g., Highway construction is usually a temporary condition and may help to improve the local situation on a long term basis.)

- If this kind of pollution continues to increase, what do you think might happen to us and our environment?

- What can we do to prevent this kind of pollution from becoming worse?

At the end of the observation sessions, students draw a picture of what they think is the worst kind of pollution caused by transportation, either in general or as observed in their community. Ask several students to present their drawings to the class and explain their reasons for choosing the pollutants they have identified.

ACTIVITY #44

Mini-unit Topic: Discovering the Environmental Effects of Transportation

Approximate Class Time: 1½-2 periods

Capsule Activity Description: Students create posters depicting the relationship between transportation vehicles and our consumption of natural resources.

Objective:

After completing this activity students will be able to identify the natural resource required to power three different vehicles.

Concepts Treated:

- Transportation vehicles are dependent on the energy provided by natural resources, such as oil and coal.
- The world's natural resources are limited.
- There is a need to conserve natural resources.

Materials Needed:

Pictures of transportation vehicles, poster board or large sheets of construction paper, paste.

ACTIVITY

Start by distributing to each student a picture of a vehicle cut from newspapers and magazines. Ask students to tell the class what fuel makes his or her vehicle move. You will probably have to point out that gasoline and oil are necessary to power a car, truck, bus, plane, and boat; subways, trolleys and trains require electricity.

If you have also distributed pictures of transportation facilities to some students, you will want to develop the concept that construction and maintenance of terminals, highways, and docks also require use of our energy resources.* For instance, buildings require heat and electricity; gas and oil are required to operate construction equipment; tar and oil are used to resurface roads.

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*you might want to consult the Readings at the end of the chapter for additional information on this topic.

Ask students if they know where this energy comes from and ask them if our energy sources are limited or unlimited. Ask students to give you their ideas on what a natural resource is.

Correct any misconceptions held by the students and explain how we are dependent on the natural environment to provide the energy needed to make transportation vehicles operate. For instance, electricity requires the use of water and fuel, such as coal, natural gas or oil, gasoline must be processed from crude oil. While it is possible to plant seeds to grow wheat and other food products year after year, it is not possible to plant coal or oil. Once resources such as coal or oil are taken from the natural environment, they are gone forever. While there is enough energy today to operate transportation vehicles and other things which require the use of our natural resources, there may not be sufficient energy supplies in the future. Therefore it is important that we use our energy resources wisely so as to protect future generations.

Ask each student to paste his or her picture on a large sheet of colored paper or poster board, leaving room to draw a box (about 4" square) in an upper corner. In this box, each student will draw or paste a picture of the natural resources required to make the pictured vehicle move. Then ask students to make up appropriate slogans, such as save our resources, and tell each to print his or her slogan across the bottom of the poster.

After you have hung posters around the room, discuss with the class recent actions that government, industry, and individual citizens have been taking to conserve energy in the transportation field (e.g., 55 mph speed limit; promoting greater use of public transportation and more efficient use of the automobile (carpooling); and emphasis on smaller cars).

SUPPLEMENTARY ACTIVITIES

Activity #45 which follows can be used either in conjunction with one of the mini-units or by itself.

Activity #46, the last activity, suggest quiz questions you can use after teaching one or more of the mini-units or individual activities.

ACTIVITY #45

Supplementary Activity Approximate Class Time: ½-2 periods

Capsule Activity Description: Students engage in one or more mini-activities or science experiments on transportation's effects on the environment.

Objective:
After completing this activity students will be able to illustrate a case study of their community showing the effects of transportation on the environment and the people who live there.

Concepts Treated:

- Transportation has varying effects on the environment--both beneficial and harmful.
- Different modes of transportation have different effects on the environment.

Materials Needed:
See individual mini-activities for required materials.

ACTIVITY

1. Students engage in one or more mini-activities that illustrate transportation's positive and negative effects on the environment and identify the nature of transportation modes and facilities.

2. Pictures of modes of transportation are arranged on a large circular card with a spinner in the center. Students spin the spinner, which should land on one picture, and they tell all they know about the environmental effect that particular form of transportation produces. Students should be reminded that although the public seems to be most aware of air pollution, other types of pollution, such as noise, water, and visual are often caused by transportation. Students should also be reminded to identify beneficial effects transportation has on the environment.

3. Students discuss the differences between transportation effects on the environment found in the city and those found in the country. A chart is made listing differences and similarities. To follow up this discussion, students are provided with pictures (magazine or student-made) of transportation effects on the environment and two boxes labeled city and country. Students decide where each form of transportation effect pictured would most likely be found.

4. Students, with your help, make a map of the local area, including roads where cars, trucks, motorcycles, taxi cabs, fire engines, etc. travel; areas where airplanes fly over, as well as an airport if applicable; where trains run; where snowmobiles or boats are used; and where any other appropriate form of transportation operates.

The map is pasted onto an old metal window screen. Students make paper replicas of the forms of transportation used in the areas designated by the map and then attach these replicas to magnets. The forms of transportation are then placed in their proper places on the map, and their movement shown.

5. Students listen to recordings of automobile, train and other transportation sounds. They identify the sounds and discuss the familiarity and frequency of the sounds they are hearing and whether they are pleasant or unpleasant to hear. This activity can also be extended to include a discussion of whether any of these noises should be avoided or banned, and if so, why.

6. Students develop a chart listing the positive and negative effects of transportation on the environment. As many forms of transportation as possible should be evaluated. An example of such a list is

Form of Transportation	*Positive Effect*	*Negative Effect*
Tractor	Preparing ground for planting	Noisy

7. Students choose a mode of transportation to role play. You may wish to supply pictures from which they can choose modes and roles. Classmates are given clues and are then asked to identify the mode. Pantomime can be used instead of role play, the clues being bodily movements.

8. Students create comic strips showing a harmful and beneficial effect of transportation on the environment. An example of such a comic strip is a picture of a bus being driven down a street and emitting a large amount of black smoke. Another example is a picture of a plane spraying crops for insects. The next section shows a student remarking about the bus smoke or crop spraying to another student. The third picture shows students discussing what can be done about the emission problem or how some forms of transportation can help the environment. Comic strips of this nature may be made into a weekly event, as an environmental reminder, or for publication in the school newspaper to promote awareness and discussion.

ACTIVITY #46

Supplementary Activity Approximate Class Time: ½-1 period

Capsule Activity Description: Students answer questions on transportation and the environment.

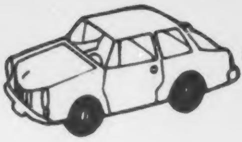
Objective:
To evaluate what students have learned during their study of transportation and the environment.

ACTIVITY

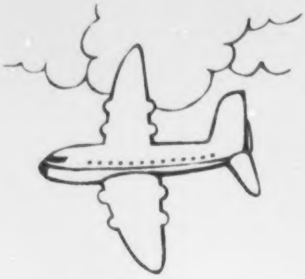
A series of questions follows on transportation and the environment. You will want to choose only those questions which treat aspects of transportation and the environment which your students have studied.

These quiz questions can be used to evaluate a mini-unit or to supplement the evaluation methods included in the activities.

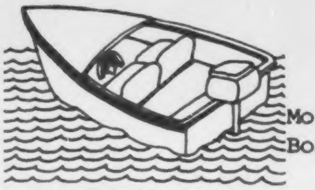
1. Draw a circle around the pictures of all the things that can hurt the environment.



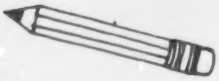
Car



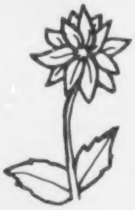
Plane



Motor Boat



Pencil



Flower

2. Fill in the blank with the right word.

Words to use:		
	Garbage	Forest fires
	Work	Food
	Fun	Long

(a) My mom takes a car to __________.

(b) Every Monday a truck picks up _________at my house.

(c) A plane carries people __________distances.

(d) Snowmobiles are ___________________.

(e) Trains carry __________ from farms to cities.

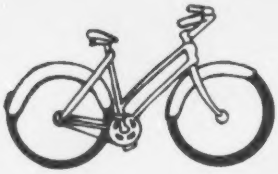
(f) Helicopters can help to spot ________ _________.

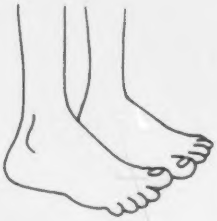
3. Draw a picture of what you think is the worst kind of pollution in your neighborhood.

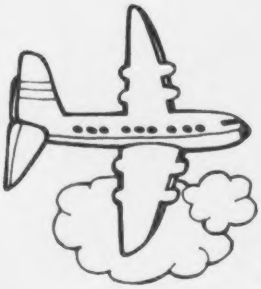
4. Read these names of things used for travel.

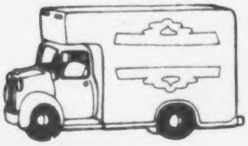
Bicycle
Car
Motor Boat
Airplane
Truck
Bus
Feet
Taxi
Train

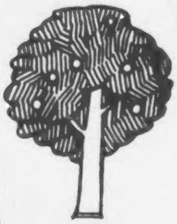
Write the right name under the picture of each thing used for travel.











5. Fill in the blank with the right words.

Words to use:
Litter
Noise
Air
Oil

(a) What kind of pollution hurts your ears? ______________

(b) What kind of pollution smells bad? ______________

(c) What should not be thrown out of cars? ______________

(d) What makes water dirty? ______________

Answers

1. Car, plane, motorboat

2. (a) Work
   (b) Garbage
   (c) Long
   (d) Fun
   (e) Food
   (f) Forest fires

3. ----------

4. Bicycle, truck, feet, airplane

5. (a) Noise
   (b) Air or litter or oil
   (c) Litter
   (d) Oil or litter

READINGS ON TRANSPORTATION AND THE ENVIRONMENT

ENVIRONMENTAL AND HEALTH EFFECTS OF AIR POLLUTION*

The effects of air pollution vary with time and place and person, but few of us can escape these effects altogether. Air pollution can impair health. Dirty air makes eyes water and smart; it stings the throat and upsets breathing. People with chronic lung or heart disease are particularly vulnerable to air pollution. Epidemiological studies indicate that direct relationships exist between prolonged exposure to polluted air and the incidence of emphysema, bronchitis, asthma and lung cancer. Polluted air, sustained and heavy for several days, has caused serious illness and death--especially among infants, the elderly, and people with weakened hearts or lungs.

More obviously, air pollution reduces visibility. It can spoil scenic vistas. It can ground planes and make driving hazardous. Its corrosive qualities cause vast economic losses and contribute to the deterioration of cities. It rots and soils clothes, discolors house paints, and rusts metals. It marks monuments and public buildings and increases housekeeping chores and costs for families and businesses.

Damage from air pollution affects rural areas too. It injures vegetation, stunts the growth of shrubs and flowers, damages crops and trees and causes illness among livestock. To farmers, these costs are direct; to most of us, they come indirectly in the form of higher food bills.

Air pollution threatens the delicate, complex natural systems on which all life depends. Undesirable ecological changes may well be its most dangerous long-range result. Signs of climatic alternations are already appearing, at least on a small scale. In 1969 we poured 281 million tons of pollutants into the air in the United States alone, ignoring the dangers that we might be degrading our environment beyond repair.

Automobile Emissions and Their Control

The automobile is one of the nation's major environmental polluters. By weight, more than half of all of the nation's man-made air pollution can be attributed to the internal combustion engine. In some urban areas, it reaches 85 percent of the total quantity of air pollution. Its exhausts include carbon monoxide, hydrocarbons and nitrogen oxides. The automobile also emits varying amounts of lead abestos and other pollutants, many of which end up in the lungs.

Efforts to reduce the level of auto emissions in this country are proceeding along three fronts. Individuals are being encouraged by public interest organizations to increase their use of less polluting modes of travel--car pools, bicycles, walking, and public transportation--and to maintain their automobiles in optimum emission-reducing condition. At the same time, Congress recognized, in passing the 1970 Clean Air Amendments, that the real problem rests with the internal combustion engine itself. Finally, the various states having major air pollution problems have undertaken a program of controlling emissions from already existing vehicles.

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*This reading has been adapted from *A Citizen's Guide to Clean Air*, the Conservation Foundation, 1717 Massachusetts Ave., N.W., Washington, D.C. 20036 under contract with the U.S. Environmental Protection Agency, Catalog No. 71-187901, January 1972.

The 1970 Clean Air Amendments

This law requires that the Federal Environmental Protection Agency (EPA) set standards for emission of carbon monoxide, hydrocarbons and nitrogen oxides. On June 30, 1971, EPA announced a staged schedule for emission reduction which would ultimately result in the following maximum levels of the three major pollutants:

3.4 grams of carbon monoxide per vehicle mile	(1975)
.41 grams of hydrocarbons per vehicle mile	(1975)
.40 grams of nitrogen oxides per vehicle mile	(1976)

The burden of achieving these standards rests with the automobile manufacturers who may request extensions in the timetable but must ultimately comply with this legislation.

Assuming that the automobile manufacturers do eventually meet standards, how reliable will the emission control devices be? The earlier devices have not proved to be entirely satisfactory. The *Washington Post* reported on August 29, 1971, that

> a seven-city survey of 1,000 privately driven 1970 models, averaging 9,000 miles use, found them exceeding their carbon monoxide ceilings by 100% and their hydrocarbons by 50%. EPA scientists do not know why these 1970s showed such poor results, but theorize that ignition and stalling problems prompted owners to take their cars in for adjustments that distorted the performance of emission controls, which rely on a retarded spark and a clean fuel-air mixture.

The 1970 Clean Air Amendments authorize the agency to test assembly-line models and require the manufacturers to do so also. The Act prohibits manufacturers or dealers from selling noncomplying vehicles and from removing or making inoperable any control device. Penalties for violation of this section are as high as $10,000 for each offense. EPA is required to publish the results of emission tests performed on prototype and assembly-line models of all makes of new cars. Citizens can consult the regional EPA offices to find out when the results are published in the *Federal Register*.

Beginning with 1971 model cars, manufacturers have been required to include in their new car warranties a guarantee that the car complies with applicable emission regulations and that it is free from any defects that would prevent it from complying during its useful life (five years or 50,000 miles). When better tests have been developed to check the performance of the emission control devices, the manufacturers must provide new warranties which require that they replace at their own expense any faulty control device if, during the car's useful life

1. The faulty device was maintained and operated in accordance with the manufacturer's instructions;

2. Failure of the device results in the owner being penalized, including the loss or right to operate the car, fines, and so on.

The law also provides a Federal program for the purchase of special low-emission vehicles for government use, once they are developed. Citizens may decide to urge their state and municipal governments to adopt similar purchase requirements. Once the Federal certification and purchasing program has stimulated the development of such vehicles, state purchases can help expand the market. The city of Boston has already announced its plan to convert all city-owned cars to run on liquified natural gas. Since the costs of fuel and maintenance for this fuel are lower than those for ordinary cars, Boston hopes to recover much of its initial changeover investment while reducing air pollution in the city.

State Responsibilities for Auto Emission Control

Although the 1970 Clean Air Amendments specifically prohibit states (except California) from setting their own emission standards for *new* vehicles they do retain the responsibility of controlling emissions for *existing* vehicles. This poses a number of problems, such as establishing vehicle inspection and enforcement programs, developing other control strategies and ensuring the availability of alternative modes of transportation.

Auto emission standards are only as good as their enforcement, and enforcement may be almost impossible without a practical, reliable inspection system. Many states are contemplating adding an emission inspection to their automobile safety inspection, but several factors should be considered before such a decision is advocated by citizen groups. One of these is the lack of simple and reliable testing equipment and procedures which produce replicable results. Several practical and reportedly accurate testing systems are under development, but they may prove expensive. Expense itself is another factor. Will the benefits of an inspection program outweigh the cost of establishing and maintaining it? The initial investment for a statewide system can easily run into millions of dollars, and the results of a few experimental programs have been disappointing. It is often difficult to get proper repairs for cars that have failed the test. Once the control device is adjusted, it may only remain that way for a couple of months. Emission control devices do curtail vehicle performance, especially in acceleration and idling. Thus, a third problem is the tendency of many motorists to adjust their cars properly only to pass the test, and then readjust them to operate more satisfactorily.

Another problem to be considered is the operational difficulties of administering a state-wide inspection program in states having varying amounts of air pollution, depending on the distribution of population, the distances between urban centers and meteorological conditions. Sparsely populated states may find the costs of operating such a system prohibitive. Finally, the heaviest burden of a vehicle inspection system may well fall on low-income car owners who often drive the older and less-cared-for problem cars and generally have poor access to public transportation to much needed jobs, schools and shopping.

There are alternatives to vehicle inspection systems which show promise for effective reduction of air pollution. These methods focus on reducing the total number of miles driven by all cars in a heavily polluted area, instead of on the emissions of an individual vehicle. These control strategies include reduction of highway construction, restriction on driving in certain downtown areas, incentives to car poolers, taxes on mileage or on gasoline, express busways along existing freeways, and the development and support of high quality public transportation in urban areas. They are generally part of a state's "implementation plan"--that plan required under the 1970 Clean Air Amendments for the "implementation, maintenance and enforcement" of any air quality standard set forth by EPA.

Before advocating either an emission inspection program or alternative control strategies, citizens may want to do further research on the advantages and problems of each. One place to start is with two studies done for EPA by the Institute of Public Administration. These are Governmental Approaches to Air Pollution Control and Governmental Approaches to Automobile Air Pollution Control. Both studies present interesting discussions of the economic and administrative dimensions of different control strategies.

The Citizen's Role

In addition to curtailing the pollution from their own vehicles, citizens have several other responsibilities with respect to controlling automobile pollution. The first of these is being informed. The 1970 Clean Air Amendments recognize the right of citizens to know what the air quality situation is in their respective regions. States are thus required to gather emission data from individual sources, correlate them with the standards, and make this information available to the public. Citizens in some states may want to press their state agencies to make such reports available in local libraries or other accessible locations.

Even more important is attendance at and participation in public hearings. The Clean Air Amendments of 1970 declare that public hearings must be held in each state before it adopts an implementation plan and sends it to EPA for approval. Each state must

1. Provide at least 30 days' notice of a hearing through prominent advertisement of the hearing's date, time and place;

2. Make available for public inspection, in at least one location in each control region, the principal portions of the proposed implementation plan for that region;

3. Make available for inspection all rules and regulations proposed for inclusion in the plan; and

4. Keep hearing records that will contain, at a minimum, the list of those testifying, together with the text of each presentation.

Citizens may want to press state officials to hold a public hearing in their locale, even though technically only one is required in the state. Attendance of large numbers of people at hearings who support strong plans and testify to this effect, however briefly, will help counter the arguments of those who claim that environmental concern is a passing fancy. This testimony will help to build a good hearing record which is important in EPA's consideration of whether or not to approve the plan. Also, if there are any legal challenges to the plan, the court will base its decision, in part, on the hearing record.

Finally, the 1970 Amendments specifically recognize the right of citizens to bring suit against any violator of standards or other requirements of the Act. Any "person" may sue another "person" for failure to enforce or comply as required. "Person" is defined as "an individual, corporation, partnership, association, State, municipality, or political subdivision of a State." There are two limitations to this right: no one may sue EPA for an action not specifically required under the Act, and no one may sue his own state, except under certain circumstances. The Act authorizes any court to award any costs of litigation, including expert witness fees and reasonable attorney fees, to any party to a suit, as the court thinks appropriate. Although this provision removes one of the common deterrents to litigation by private citizens--expense--court action can still be very difficult and time consuming, and may not always be the most effective way to proceed. A good attorney should be consulted on the desirability of taking this kind of action.

HIGHWAY BEAUTIFICATION ACT OF 1965*

Title II of the Highway Beautification Act provides for the control of junkyards which are within 1,000 feet of the nearest edge of the right-of-way and visible from the traveled way of the interstate and Federal-aid system.

The act also provides reimbursements to the states, the District of Columbia, and Puerto Rico for 75 percent of eligible landscaping and screening costs and for 75 percent of the cost of just compensation for the relocation, removal or disposal of those junkards which cannot as a practical matter be screened.

The law further stipulates that the states must enact legislation to control future junkyard locations through licensing and zoning, and thereby avoid the expense of bringing new facilities into compliance.

Junkyards located in industrially zoned areas or in unzoned industrial areas of similar character are exempt from control under the Federal law.

Failure by the states to comply with the provisions of the Highway Beautification Act could subject them to a penalty of a 10 percent reduction of their annual Federal-aid highway funds.

To determine the extent of the problems adjacent to the Interstate and Federal-aid primary systems, all 50 states, the District of Columbia, and Puerto Rico have made a detailed inventory of all junkyards adjacent to these systems as of October 22, 1965. The inventories show that approximately 80 percent of the junkyards can be concealed from the main traveled way by natural objects, plantings, fences, or other means. The remaining 20 percent must be relocated, removed, or otherwise disposed of.

Each location to be screened must be treated individually to meet the specific condition. It is not the intent to conceal a place of active business but merely to soften the visual impact of the exposed junk. The screening should extend beyond and blend with the immediate area. The following general types of screening warrant consideration.

1. Highway border plantings of trees, shrubs, etc., of a size and density that will largely impair view across the right-of-way line.

2. Earth mounds graded and rounded to a reasonably natural appearance and planted with grass or nonmowing ground cover.

3. Open wire, chain link, wood, or other fences covered with vines to provide the effective screen.

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*This reading has been adapted from *Junk and Control: Highway Beautification Act of 1965.* U.S. Department of Transportation, Federal Highway Administration, 1967.

4. Open wire, chain link, wood, or other fences with inserted light metal, wood, or plastic strips to provide the screen cover.

5. Solid or semisolid fences such as board, picket, or sapling wood types; metal with lightweight panels, expanded mesh, and other commercially available types (100 percent screen at all angles of view is not considered essential): or other available materials such as fiber glass or asbestos board panels.

6. Walls, preferably pierced or open type, of stone, brick, concrete block, or some combination of materials in keeping with the general area, limited to practical heights.

7. Combinations of the above.

When planting alone is used, it is more desirable and economical to provide an open screen effect. Glance views of junkyards at normal highway speeds are not objectionable. A solid screen may be unnatural and inappropriate in relation to the adjacent roadside vegetation and development. Plants should be of varieties comparable to those which exist in the area. Fully mature trees should rarely be used as they may have a low survival rate. Plants should be of a variety that will grow relatively fast so that effective screening is attained within a 2- to 5-year period. In many instances, planting may be accomplished within the presently owned State right-of-way. Where this cannot be accomplished, it will be necessary to arrange with the owner to screen the junkyard on his property.

BENEFICIAL EFFECTS OF HIGHWAYS ON THE ENVIRONMENT*

Well, are we paving the country?

Far from it. All roads, including city and suburban streets, occupy less than one per cent of the land area in the United States. Federal studies in nearly 50 larger cities show that the percentage of land occupied by roads in developed areas is declining. The land is being used for larger lots, more open spaces, landscaped areas. Overall, even with the growth of new arterial highways and expressways, roads take up no greater percentage of the nation's urban areas than they did before the auto was invented.

But aren't we still building a lot of new highways?

Not as many as it would seem. The great bulk of our work, carried out by the New York State Department of Transportation and other transportation agencies throughout the nation, is being done on or near existing roads. Only a small part of our total highway construction mileage involves building roads through totally new areas.

Well, then, why are we spending so much on highway work?

Roads become worn out and outmoded. We have more people, more vehicles and, most importantly, more usage of these vehicles all the time. A highway built in the 1920s or 1930s in a rural area may well be a congested, dangerous route today, bordered by mushrooming residential or commercial development. Such a road, and there are many of them, should be replaced with a safe highway built for today's traffic demands and the demands of the future.

The interstate highway system now coming into being throughout the nation is adding 42,500 miles of new expressways. This is only a bit more than one per cent of the nation's road and street mileage, but it will carry more than 20 percent of the travel. This means freeing older roads of congestion, making all highways easier to travel and safer. In New York State, with all but 15 percent of its 1,350 miles of interstate highways in service, these new highways are removing traffic pressures in both rural and urban areas, saving time and money for highway users. Most of all, they are saving lives. Federal officials report that a life is saved each year for every five miles of new interstate highway placed in service. For New York State, that means 230 lives a year being saved now and 270 lives when the system is completed.

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*This reading consists of excerpts from "Are we Paving the Country?" distributed by the State of New York Department of Transportation and "Benefits of Interstate Highways," distributed by the U.S. Government Printing Office.

Couldn't a lot of this highway travel be accomplished by public transportation?

It can be and is, in the large cities. Elsewhere, the private passenger car is the workhorse of passenger transit, accounting for 98 percent of the intercity travel. In most cities, public transit means buses--and they need highways too. Even in the metropolitan areas, cars are needed to get to airports, train and subway stations, bus stops. The fact is that the private car gives a freedom of mobility and wide open schedule for travel that makes it the most used mode of transportation by far.

Large-scale technological improvements such as the interstate highway system often result in profound and sometimes irreversible changes in the natural and manmade environment. Interstate highways can play a vital role in protecting and enhancing the desirable elements of the physical environment, for example, by increasing opportunities for people to enjoy the beauty and uniqueness of the environment, through greater accessibility. Independent alignment of dual lane interstate highways improve erosion control, restriction of billboard advertising, and selective tree trimming, all contribute toward increasing opportunities for enjoyment of the environment while protecting its ecological structure. Also, highway agencies frequently develop or assist in programs to protect environmental features of scenic, historical, educational, recreational, symbolic, or ecological significance. For example, a number of states have used interstate construction to create recreational lakes from excavations for highway construction, rest areas utilizing Indian mounds, dinosaur tracks, or other historic or natural features.

Interstate highways can have a significant beneficial impact in reducing air and noise pollution in urban areas. Interstate highways, often constructed to bypass downtown areas, reduce unnecessary travel through downtown areas where existing noise and air pollution levels are high. Also, interstate highways eliminate considerable pollution and noise effects of stop-and-go traffic on city streets. The following (from the *American Roadbuilder,* January 1969) shows the dramatic improvements expressways can make in reducing automobile carbon monoxide emissions.

Type of Traffic Situation	*Pounds of Carbon Monoxide per Vehicle Mile*
Expressways	0.11
Arterial streets	.22
Local streets	.27
Central business district	.42

The primary reason for this very significant difference in carbon monoxide emissions is that the amount of unburned gasoline increases sharply when an engine is accelerated or decelerated. For example, when an automobile is cruising less than 2 percent of the total fuel supplied to the engine is emitted unburned through the exhaust pipe. During deceleration, this increases dramatically to 18 percent. Average speed also plays an important role. A change in speed from 20 mph to 30 mph yields a one-third reduction in total emissions. Air pollution emissions are at a minimum when vehicles are traveling at a relatively constant speed such as on interstate highways. Similarly, interstate highways reduce the more disturbing peak noise levels created by trucks and other noisy vehicles by reducing the need for acceleration and deceleration generally characteristic of travel on neighborhood streets.

Recent advances in the design of interstate highways not only make them more esthetically appealing, minimize neighborhood social and economic disruption, but are also beneficial in terms of reducing air and noise pollution levels. For example, a modern, well designed, elevated structure is visually pleasing, does not inhibit mobility and reduces noise levels in nearby areas. Depressed areas also reduce noise levels. Some interstate highways are now being designed with exclusive bus lanes which will reduce air and noise pollution by decreasing the number of autos and by providing free-flowing bus traffic. Interstate highways help reduce air pollution levels in urban areas by another indirect way. The relationship between interstate highway improvements and industrial decentralization is well known. Both the benefits and hardships of the movement of industry from the center city have been well documented. Evidence is mounting that urban air pollution problems are caused not only by the presence of such things as smoke stacks and automobiles, but by the overall spatial and temporal arrangement of these urban elements--in short by urban form.

USE OF AIRCRAFT TO HELP THE ENVIRONMENT*

Many of the positive effects aircraft have on the environment take place in relatively unpopulated areas, thereby escaping notice of the public in general. Occasionally, headlines may highlight some spectacular happening, involving aircraft, but the day-in, day-out operations take place with little fanfare. These routine aircraft operations affect the environment beneficially in the following ways.

Agriculture

Airplanes and helicopters apply seeds, fertilizers, herbicides, insecticides and growth regulators to various crops. Aircraft are able to give better coverage to the crops and can accomplish the work more quickly and effectively than ground operated equipment. In addition, many farmers are utilizing aircraft for planning and checking on farming operations.

Today practically all rice is sown from the air, along with barley, wheat, alfalfa, ladino clover and many other small-seeded plants. Tomatoes are dusted when fields are wet, before worms can cause damage. Weeds, such as blue mustard, can be controlled. This weed can reduce wheat yield by 20 bushels per acre through the existence of only nine weed plants per square foot. During and after spring rains, aircraft can make these applications without destroying newly sprouted crops or becoming mired in the mud which would entrap ground vehicles.

Even better quality, more reasonably priced clothing, can result from agricultural spraying. The boll weevil, scourge of the cotton planter in the early 20th century, has been all but eliminated through aerial application of pesticides. Defoliating agents applied to cotton plants prior to picking allow mechanical harvesters to pick bolls relatively free of leaves and other extraneous plant material. The absence of these impurities allows fewer processing actions, longer staple length, and, ultimately, a better product.

Livestock Production

The airplane has long been one of the livestock producer's handiest tools. Inventory and control of herds is now regularly accomplished from the sky, covering in a matter of hours what would have taken days or weeks by horseback.

When winter blizzards howl across the plains, piling deep snow drifts and cutting herds off from food supplies, aircraft lift hay and grain to stranded animals. Aside from the aversion of economic loss to the rancher, cattle are saved for market, thereby assuring more plentiful and less costly beef to the consumer.

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*Adapted from *Aircraft and the Environment,* Federal Aviation Administration.

Forest Management

In 1971, the U.S. Forest Service flew a total of 96,539 hours; 75,984 in fixed-wing aircraft, and 20,555 in helicopters. Of this total, 73,897 were flown in fire control activities, 5014 in timber management, and 3581 in engineering work with the balance for miscellaneous activities. In addition to government activities, private timber companies utilize aircraft extensively for management of their reserves.

Firefighting Activities

As indicated by the aforementioned statistics, forest fire control activities utilize the largest percentage of aircraft hours flown. In 1971, the Forest Service fought 2812 forest fires with the help of aircraft. Aircraft enable rapid investigation of the extent of fires and provide a picture of the best access to and means of fighting a fire once one starts. Aircraft provide a rapid method of fire-fighting by dumping borate or water, versus having ground-based fire fighters drive to the area with the attendant time delay in ground transportation. The Canadian "scooper duper" amphibian fire bomber can drop 252 tons of water in 5 hours. Helicopters are used to transport personnel to the fire area, permitting fighting of the fire while it is still in the early stages and often preventing its spread. When helicopters are unavailable or unsuitable, airplanes often carry "smoke jumpers"--specially trained parachutists who can quickly get into otherwise inaccessible areas. Aerial observation of a fire in progress enables a rapid and accurate method of directing ground personnel in their fire fighting efforts.

By saving millions of acres of valuable timber from the devastating effects of fire, a more plentiful supply of lumber is available for home building and other purposes.

Forest Seeding and Fertilizing

After trees have been cut from a forest area, sound management practices dictate a reforestation effort in order to preclude erosion and to establish a new stand of timber for future harvesting. Hand planting of seedlings is effective, but time-consuming and costly. Aircraft, dropping pine, fir or other evergreen seeds, can cover cut-over areas in a matter of minutes. Although many seeds do not germinate, experience has proven that enough will to do an effective replanting job. Once seeds have been sown, fertilizers are applied from the air to promote rooting and plant growth.

Insect/disease Control of Forest Areas

Trees, like other living plant life, are susceptible to infestation by borers, insects, fungus and other damage-causing bodies. Plant diseases, like human diseases, can assume epidemic proportions and can wipe out large forest areas if not brought quickly under control. Such diseased forest areas are quickly detectable from the air through the use of techniques such as infrared photography and other sophisticated methodology. Once detected, forests can be sprayed by aircraft to eliminate disease threats.

Selective Logging Practices

Normal logging practices often cause great devastation to forest areas. Numberous roads must be cut to allow access to logging trucks, bulldozers and other heavy equipment. Areas are clean cut to allow easy retrieval of marketable timber. The results are often scarred and eroded hillsides, unsightly piles and brush and felled trees too small to be of value, and destruction of natural wildlife cover. Although still in the developmental stages, aircraft have shown the potential to change this.

Helicopters, and in a few instances, aerial balloons, are being used to lift logs from cutting areas to a central collection point. This eliminates the need for roads and allows selective cuttings of only marketable trees. It also allows previously inaccessible areas to be selectively logged without destroying their surroundings.

Game Management

Aircraft add a great deal of flexibility in the area of game management. More accurate inventories are possible from the air. Animals can be tagged, studied and redistributed to more provident areas through the use of aircraft. In wintry weather, where starvation becomes a real threat, hay and other foodstuffs can be air-dropped at strategic locations. And, to the delight of the avid angler, remote lakes are stocked with fish.

Weather Control

Present weather experimentation, such as cloud seeding by aircraft, will undoubtedly some day allow man to more effectively control his environment. Already man can produce rain in some dry areas with some degree of assuredness. Experiments with fog dispersal are also underway. Through the use of high-flying aircraft, man can also effectively monitor such things as radiation levels, particulate matter, and upper-air moisture content. Aircraft constantly penetrate hurricanes and thunderstorms to learn more of the destructive effects of nature. Through increased knowledge, man will be able to save untold suffering and property damage now inflicted by natural forces.

Energy Related

The rising demand for more energy; electricity, gas, oil, and coal by the American public will undoubtedly require more transmission lines to move it from its source to its ultimate consumer, e.g., the controversial Alaska pipeline. Helicopters are already extensively used for transporting and erecting towers and transmission lines and pipeline components in remote areas. Aside from being more economically effective, helicopters allow construction techniques which do minimal damage to the environment.

Once these lines are installed and in operation, aircraft regularly patrol them to inspect for damage or leakage. Quick detection by aircraft of oil leaks, for example, and subsequent movement of repair crews by helicopter would prevent any substantial environmental damage.

Insect Control

Disease-carrying insects, such as the malarial mosquito, once took a large toll in human suffering. By teaming the airplane with effective insecticides, most such threats have been either eliminated or kept in check. The recent ban on widespread usage of DDT as a control agent sent currents of alarm throughout the world. Undoubtedly, other agents will be developed, but without the airplane to apply them, the agents would lose much of their effectiveness since areas such as swamps are virtually inaccessible to other means of transportation.

Efficiency as a People-mover

Aircraft produce fewer pollutants per passenger mile than any other form of motorized transportation we enjoy today, with the exception of rail travel.

As an example of relative pollution intensities, we might compare a New York City to Chicago trip by a B-727 aircraft carrying 100 passengers with a trip by auto carrying 4 passengers. The total amount of emissions is 12.8 pounds per auto passenger compared with 1.9 pounds per aircraft passenger. Economies of scale with the wide-bodied jets reduce this figure even lower.

If the 183,000,000 passengers enplaned by the domestic airlines for 1972 were forced to utilize conventional motor vehicles as an alternative, the increased number of vehicles required and the resultant pollution levels would cause considerably more pollution.

Pollution Spotters

Aircraft today are continuously monitoring antipollution efforts. Oil spills on oceans, lakes and rivers and leakages from off-shore wells can be effectively tracked and control efforts directed from aircraft. Pollution sources in rivers and creeks can be traced from the air, especially when water or surface travel is hindered by rapids, private property rights, and other obstacles. Aircraft also routinely monitor compliance with air pollution standards.

THE EFFECT OF NOISE ON MAN AND THE NATURAL ENVIRONMENT*

It is generally agreed that noise has adverse effects, residents of areas near airports and freeways need no convincing. If we are to restore our peace and quiet we must have sufficient understanding of the effects of noise to direct us to suitable action. This reading describes the effects of noise on man and on the natural environment.

Noise-induced Hearing Loss

How much noise can the human ear tolerate? Attempts have been made to answer this question for continuous noise exposure in work environments. The problem of estimating critical noise levels for transportation noise is more difficult because of its irregularities, for example, airplane departures and landings. The main impact of transportation noise on personal well-being may be its aggravation of a hearing impairment already induced by the noisy work environment. Consider, for example, an individual exposed to high noise levels at work, traveling to and from work, and at home trying to relax or sleep. This endless exposure to noise may hasten the onset of serious hearing losses, nerve damage and poor health.

It is presently an extremely difficult task to specify the allowable exposure for brief and intense (ten seconds) transportation noise exposures. A maximum tolerable limit for the unprotected ear can be set at 120-135 dB. Current data on transportation noise levels suggests that *by themselves* these irregular transportation systems maintain constant high levels of noise (85-90 dB(A) and up for 8 hours per day), then there exists a serious risk of hearing impairment.

Nervous System Responses to Noise

Noise can cause the body to activate its defense system, the autonomic nervous system, which controls many critical bodily processes (heart output, hormone control, digestion). Noise is responded to as a stress, and the more stresses bearing on man at any given time, the quicker the bodily defenses can be overwhelmed. The specific effects noise has been shown to have on man, depending on its intensity and duration, include an increase in muscular tension, sweating, metabolic changes, reduced gastrointestinal activity, nausea, headaches, tinnitus, drowsiness, respiratory irregularities and emotional disturbances. Although these effects are signs of autonomic arousal, this is *not* necessarily dangerous to the organism unless the arousal is maintained for prolonged periods of time causing depletion of bodily defenses.

Sleep Disturbance

One of the chief complaints about transportation noise is its disturbance of sleep and relaxation. The major offender is the airplane, owing

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*The reading has been adapted from *Transportation Noise Pollution: Control and Abatement*--edited by David O. Dickerson, 1970. Summer Faculty Fellowship Program in Engineering Systems Design, ASEE-NASA Langley Research Center, Old Dominion University Research Foundation.

to its loudness and unexpectedness. Disturbance of sleep is of primary importance because of its necessity for normal psychological and physiological functioning. Aggravated sleep loss has a profound effect on body health, particularly for the aged and the sick, and can become a significant factor in personal well-being. Testimony before a state legislative committee on jet noise in New York cited paranoid delusions, hallucinations, suicidal and homicidal impulses as some of the possible consequences of continuous sleep loss.

The levels of noise that sleepers can tolerate vary widely. A mother is awakened by her baby's cries while the father sleeps peacefully. A dripping faucet can prevent sleep. A jet transport screeches overhead and startles the sleeper awake. Although it is not obvious what characteristics are shared by these sounds, certain fundamental rules can be set forth:

- The louder the noise, the greater the disturbance of sleep
- The more meaningful the sound, the greater the chance of disturbance
- The more unexpected the noise, the greater the chance of being awakened
- The greater the presence of certain personality traits, i.e., neuroticism, the greater the sensitivity to noise
- The younger the child, the greater the susceptibility to interference from aircraft noise
- The greater the age or poorer the health, the lower the resistance to noise disturbance

Psychological Effects of Noise

Noise can have a deleterious effect on man's day to day existence. There is no reported research on the psychological effects of transportation noise, but there are some inconsistent findings on noise in the work environment. A large portion of the research concludes that noise causes a significant increase in work errors and the quantity of work produced. The same applies to students in school. Other studies conclude that individuals with high levels of anxiety perform better under noisy conditions than under quiet ones. Most of the research agrees that the psychological effects of noise vary with the quality of the sound--its duration, direction, frequency and unexpectedness.

Effects of Transportation Noise on the Natural Environment

Noise seems to accompany man wherever he goes. Outdoor recreation has become more and more mechanized and more and more noisy. The burgeoning popularity of trail bikes and snowmobiles has taken man into the quiet forest and mountains in a very intrusive and noisy manner.

The noise of snowmobiles terrifies wildlife already immobilized by deep snow and in a weakened condition. The exertion of fleeing through deep snow is harmful and can be fatal. Low flying aircraft also constitute a source of terrifying noise which affects wildlife and farm animals.

THE AIRPORT NOISE PROBLEM*

The major cause of noise complaint in the last 15 years is the noise around airports. Community responses to airport noise are in some ways unique but in others resemble complaints about any noise irritation.

Studies of relations between aircraft noise exposure and annoyance have helped determine major acoustical and sociological factors affecting annoyance. Annoyance in general results from interference with normal living activities from the noise itself and from vibrations it causes in structures. Activities commonly disrupted include TV and radio enjoyment, rest and sleep, conversation, reading or concentrating, eating and working.

Disturbances can be more insidious and subtle than we may recognize. In one survey a totally deaf man, using sign language, indicated he was unable to sleep because aircraft caused vibrations which shook the house and bed. Residents near major airports have indicated alterations in social relations due to noise. Speech interference has led to friction and hostility among family members and sometimes deterioration of interfamily relationships.

Some of the more important sociopsychological factors known to affect strongly the annoyance produced by a given aircraft noise intrusion include

1. Fear of aircraft crashing
2. General attitude about noise
3. General attitude about residential environment
4. Beliefs about the preventability of aircraft noise
5. Belief in the importance and value of airports and air traffic
6. Belief in the possible effects of noise on health

These factors can be as important as the noise exposure itself in determining annoyance reactions. Thus an individual's reaction to noise seems to be only a part of a more general adjustment to the local environment.

Research suggests that the actions of people sufficiently annoyed with aircraft noise vary from complaining to officials to attempting to abate the effects of noise by keeping windows shut, sleeping with earplugs, and insulating homes. These individual responses mold into community efforts as noise levels and exposure times increase and as it becomes clear that the failure of individual remedies makes a community wide or political solution necessary.

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*The reading has been adapted from *Transportation Noise Pollution: Control and Abatement*--edited by David O. Dickerson, 1970. Summer Faculty Fellowship Program in Engineering Systems Design, ASEE-NASA Langley Research Center, Old Dominion University Research Foundation.

Community reaction to airport noise may be conveniently depicted as a chain of possible events:

EXPOSURE ⟶ ANNOYANCE ⟶ COMPLAINT ⟶ PROTEST

There is no evidence that the people who complain or protest noise are extra-sensitive to that noise, but they do tend to be more convinced that the noise could be prevented and that it affects their health.

THE NOISE CONTROL ACT OF 1972*

Background Legislation

Recognition that noise is an environmental problem that affects people other than workers has been late in coming. Federal noise legislation first appeared in 1968 when Congress directed the Federal Aviation Administration (FAA) to establish rules and regulations to control aircraft noise.

At the state and local level, laws tended to treat noise as a public nuisance, and enforcement was both difficult and spotty. More recently some jurisdictions, notably California and Chicago and New York City, have established new laws and ordinances that are based on noise generating characteristics of specific equipment and, hence, are easier to enforce.

The Clean Air Amendments of 1970 called for the establishment of an Office of Noise Abatement and Control in the U.S. Environmental Protection Agency (EPA). The legislation also called for public hearings of environmental noise and a special report to the Congress on the problem, incorporating the results of the public hearings and other special studies. Information from this EPA report as well as extensive Congressional hearings formed the basis of the Noise Control Act of 1972.

The Noise Control Act of 1972

The Noise Control Act of 1972 represents the first major Federal attempt to eliminate excess noise at the design stage of a wide variety of new consumer products.

Major Provisions

The EPA is directed to develop and publish information on the limits of noise required for protecting public health and welfare as well as a series of reports to identify products that are major sources of noise and to give information on the techniques for controlling noise from such products.

Using the criteria thus developed, the EPA Administrator is required to set noise-emission standards for products that have been identified as major sources of noise and for which standards are deemed feasible. The law requires such standards to be set for products in the categories of *construction equipment, transportation equipment* (except aircraft), *all motors and engines, and electrical and electronic equipment.* It also grants authority to set for other products, standards deemed feasible and necessary to protect public health and safety.

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*Taken from the *Noise Control Act of 1972; Highlights.* Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

EPA has authority to require the labeling of domestic or imported consumer products as to their noise-generating characteristics or their effectiveness in reducing noise-generating characteristics or their effectiveness in reducing noise. Manufacturers or importers of non-conforming or mislabeled products are subject to fines of up to $25,000 per day for each violation and to imprisonment for up to one year. Manufacturers must issue warrants that their regulated products comply with Federal standards at the time of sale. They are also required to maintain records and provide information, including production samples, if requested by EPA.

The EPA Administrator also is to prescribe noise-emission standards for the operation of *equipment* and *facilities* of *interstate railroads, trucks,* and *buses*.

All Federal agencies are directed to use the full extent of their authority to insure that purchasing and operating procedures conform to the intent of the law. EPA may certify low-noise emission products for purchase by the Federal government.

Aircraft Noise

Under the Noise Control Act of 1972, the EPA Administrator is required by mid-1973 to make a comprehensive study of aircraft noise and cumulative noise exposure around airports. Using this information, EPA is to submit to the FAA proposed regulations to control aircraft noise and sonic booms. After a hearing and further consultation with EPA, the FAA may adopt or modify the proposed regulations. The FAA may reject the proposals if it believes they are unsafe, technologically or economically infeasible, or not applicable to certain aircraft. However, it must publicly explain its specific reasons for rejection. A continuing review and consultation role is provided for EPA.

An End to Noise Pollution

This comprehensive nature of the Noise Control Act of 1972 brings under Federal regulation for the first time, nearly all of the major new sources of noise. An incentive now exists for the full employment of noise-control technology that is already available, and the day when quiet is restored appears closer. We know how to build quieter. Now the law is to give the nation the stimulation to do it.

TRANSPORTATION AND ENERGY CONSERVATION*

Transportation is a high-energy function. Approximately 60 percent of the liquid fuel consumed in the United States is used for transportation purposes.

Within the transportation sector, highway vehicles are the major consumer, accounting for nearly 40 percent of all the petroleum used in the United States.

1974 GASOLINE CONSUMPTION

Vehicles		*Barrels/day*
Passenger cars		
Getting to work		1,760,000
Pleasure driving		1,360,000
Personal business		1,020,000
Business, government		800,000
	Subtotal	4,940,000
Trucks		1,470,000
Farm vehicles		200,000
Other uses		200,000
	Total	6,810,000

Transportation's petroleum requirements *doubled* between 1954 and 1974.

Ninety-two percent of the more than 2.4 trillion "person miles" of travel annually in the United States are by automobile.

Seventy percent of all travel in the United States is by automobile; 27.6 percent by commercial air transportation; 1.5 percent by bus, and 0.5 percent by passenger rail.

Motor vehicles, therefore, are of paramount significance in U.S. fuel conservation efforts, because they are the predominant users.

In 1970 oil imports cost the United States $2.7 billion. In 1974 the U.S. paid *$23.6 billion* for the oil needed to bridge the difference between domestic production and nationwide demand.

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*This reading has been adapted from a U.S. Department of Transportation Fact Sheet of June 10, 1975.

From the days of oil surpluses in the 1960's, the United States has moved to a dependency situation. In 1974 imports were needed to supply 37 percent of our petroleum needs; unless conservation, energy conversion, and energy efficiency efforts succeed, U.S. dependency on foreign oil could rise to 50 percent by 1980.

While estimates of undiscovered oil reserves vary greatly, the known recoverable reserves of U.S. oil are reported to be 45 billion barrels. In view of contemporary consumption rates, limited reserves, and declining domestic production, petroleum independence is not attainable as a short-term goal.

Fuel conservation is essential for economic as well as for supply reasons. The motor vehicle, as the major user (about 45 percent of the petroleum used annually in the U.S.), is potentially the greatest saver--especially in view of the vast quantities of fuel wasted through carelessness, inefficiency, unnecessary driving, and driving at higher speeds than necessary.

How the 55 mph Speed Limit Saves Fuel

The nation's 105 million automobiles, 26 million trucks, and 400,000 buses consume about 75 percent of the petroleum used for transportation purposes in the United States, nearly 107 billion gallons in 1974.

The government has challenged the auto industry to achieve a 40 percent improvement in fuel efficiency by 1979, to an average passenger car performance of nearly 20 miles per gallon.

Tests by the Federal Highway Administration* show improvements in automobile fuel economy ranging from 11.8 to 28.5 percent by driving at 55 mph rather than 70 mph, depending on the size of the car.

COMPARATIVE CONSUMPTION RATES

Miles/hour	*Subcompact*	*Compact*	*Standard*	*Luxury*
30	31.45 mpg	21.33 mpg	20.33 mpg	18.33 mpg
40	35.19	21.33	20.00	19.28
50	33.05	18.94	17.50	15.62
55	31.91	18.17	16.84	14.92
60	30.78	17.40	16.17	14.22
70	22.82	15.36	14.86	12.74

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*"Effects of Speed on Automobile Gasoline Consumption Rates," a Federal Highway Administration mileage study. Copies available on request from the FHWA, Washington, D.C. 20590, Attention: HPA-1.

About half of all vehicle miles are driven under conditions where speeds above 55 mph are possible. The potential savings if 90 percent of the driving population comply with the 55 mph speed limit are estimated at 200,000 barrels of gasoline per day--20 percent of the total savings advocated by President Ford for 1975.

Average interstate speeds declined 7.5 mph in 1974. Surveys show that only 6 percent of highway vehicles exceeded 65 mph in 1974, compared to 31 percent in 1973. An important part of the 3.4 percent reduction in gasoline consumption in 1974 was due to lower speeds.

BIBLIOGRAPHY

BIBLIOGRAPHY

The bibliography contains educational materials for classroom use and for use by teachers in developing relevant units of study on transportation and the environment. It consists of selected

- Materials for teachers

- Periodicals

The individual entries in the materials for teachers section are presented in the following format:

**	*Title of Work,* author, date of publication. Number of pages or list of materials. Price.
Type of Material	Description of material with evaluation of material's quality and relevance for transportation consumer education.
	Source from which material may be obtained.*

For purposes of convenience, the teacher materials have been rated by the designation of stars next to the material description. (See sample above.) The stars represent the authors' evaluation based on the following scale:

No stars:	material is useful, but fair
(*) One star:	material is good
(**) Two stars:	material is very good
(***) Three stars:	material is excellent

It should be kept in mind that these evaluations are an estimation of the material's *quality and relevance.*** As such, the absence of a teaching material or a low rating does not per se indicate the material is poor. It may be excellent but simply not relevant to the Manual's content. In addition, any absences may be due to the authors' oversight.

At the end of the Manual is a list of government agencies which can be contacted for further information about transportation and the environment.

Allow ten weeks for delivery of items ordered from the U.S. Government Printing Office.

**A complete discussion of the criteria used to evaluate the materials may be found at the end of the Manual.

Materials for Teachers

Elementary Level Consumer Education, 1972. 77 pages. $2.00

Guide

Overview of Consumer Education at the elementary school level, with capsule descriptions of several programs in operation and of different teaching methods used. Extremely useful for its discussion of teaching methods, including field trips, classroom discussions, students teaching students, and use of newspapers. Guide also provides a series of methods for handling tough teaching problems like shoplifting and student embarrassment about being on Welfare.

Consumers Union of the U.S., Inc.
Educational Services Division
256 Washington Street
Mt. Vernon, New York 10550

* *Park and Recreational Facilities: Their Consideration as an Environmental Factor Influencing the Location and Design of a Highway*, 1971. 47 pages. 45¢.

Pamphlet

Informative discussion of what criteria should be considered when building a highway to protect playgrounds, parks, and parkways.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Transportation Noise and Its Control, 1972. 27 pages. 70¢.

Pamphlet

Informative, not too technical discussion of the nature of noise pollution, the decibel unit of measurements, the extent of noise caused by cars, trucks, planes, and rapid transit and possibilities for reducing or eliminating transportation noises.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock Number 50000-0057

** *Automotive Fuels and Air Pollution*, 1971. 32 pages. 40¢.

Pamphlet

Detailed account, for the layman, of automobile pollutants, their effects, and what can be done to eliminate or reduce them.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

** *Aircraft and the Environment*, 1973. 13 pages. Free.

Pamphlet Detailed description of the positive effects airplanes have on the environment, from crop spraying to fire fighting. Indispensable supplement to other accounts of airplanes' harmful effects on the environment.

Federal Aviation Administration
Aviation Education Programs Division A6A 300
Office of General Aviation Affairs
Washington, D.C. 20591

* *Cost of Air Pollution Damage: A Status Report*, 1973. 73 pages. $2.50.

Pamphlet A review of studies on the cost of air pollution damage on human health, vegetation, materials, and residential property values. Transportation pollution is not singled out. Very analytical.

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22151
Stock Number PB-222040

** *Readings for the Ec[illegible]ivist*, 1972. 41 pages. Price not listed.

Bibliography A bibliography of environmental publications of the Federal government for young persons interested in involvement in environmental problems. There are chapters on air, water, and noise pollution that include materials on transportation pollution.

Division of Information Services
Office of Library Services
U.S. Department of the Interior
Washington, D.C. 20240

** *Health Effects of Environmental Pollution*, 1973. 20 pages. 30¢.

Pamphlet Highly useful overview of the effects of air, water, and noise pollution on human health.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

* *Needed: Clean Air; The Facts about Air Pollution*, 1972. 15 pages. 25¢.

Pamphlet Useful but very sketchy overview of the effects of air pollution on health, energy depletion, and economic costs. Transportation is included as one of the sources of pollution.

Channing L. Bete Co., Inc.
45 Federal Street
Greenfield, Massachusetts 01301

* *Vanishing Air,* by John C. Esposito, 1970. 328 pages. 95¢. Paperback.

Book Highly critical account of government's attempt to regulate air pollution and industry's alleged attempts to avoid self-regulation. Chapter 1 on general causes and effects of air pollution and section of Chapter 6 on air pollution from airplanes are relevant and informative. Major attention is paid to automobile pollution; author blames the government for not enforcing strict standards and the industry for not taking actions of its own and attempting to avoid Federal and state controls.

Grossman Publishers
125A East 19th Street
New York, New York 10003

* *Air Pollution: The World's Exhaust,* 1971. 62 pages. $1.00

Book Overview of the air pollution problem, with discussions of smog, what air pollution is, automobile pollution, health effects, effects on the weather, and who should be responsible for preventing air pollution. Approach is to raise questions rather than present solutions.

Pendulum Press, Inc.
The Academic Building
Saw Mill Road
West Haven, Connecticut 06516

A Congregation of Vapors, 1973. 35¢.

Flyer Six-page summary of the nature and effects of air pollution and some of the problems associated with controlling it. (Not evaluated.)

League of Women Voters
1730 M. Street, N.W.
Washington, D.C. 20036

Air Pollution Primer, 1969. Price varies.

Flyer Handbook that explains air pollution's processes, sources, characteristics, and effects. Special sections on weather and radioactivity.

Available from local Tuberculosis Association

* *Railroads and the Environment in Rail Freight Operations,* 1972.
28 pages. 30¢.

Pamphlet Concise, informative discussion of railroad pollution and abatement, including odors, engine exhaust emissions, sanitary waste control, noise, and land use. Photographs.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

* *Noise Pollution,* 1972. 13 pages. 35¢.

Pamphlet Informative discussion of what sound is, how it affects our health, and general ideas for solutions. Noises from transportation pollution sources are discussed.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402
Stock Number 5500-0072

* *Noise and You,* 1970. 15 pages. 25¢.

Pamphlet Brief overview of the nature of noise and the dangers of too much and too loud noise. Not tied in specifically with transportation noise.

Channing L. Bete Co., Inc.
45 Federal Street
Greenfield, Massachusetts 03101

The Freeway in the City, 1968. 141 pages. $3.00.

Book Somewhat technical discussion of the principles of urban freeway planning and design that considers environmental concerns in terms of the view from the freeway, location of the freeway, and highway structures. Well illustrated.

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

** *The Accessible City,* by Wilfred Owen. 150 pages. $2.95.

Paperback General discussion of big city transportation problems, with emphasis on rational planning to avoid problems. Chapter on public transport provides useful background information on one alternative to the automobile. Sections on transportation planning consider concerns about land use and esthetics.

The Brookings Institute
1775 Massachusetts Avenue
Washington, D.C. 20036

** *Highways and our Environment,* by John Robinson, 1971. 332 pages. $24.00.

Book Well-written, highly informative, and impassioned account of how highways and the automobiles they serve have blighted the environment with litter, concrete, air and noise pollution, and visual unsightliness. Chapters on Citizen Action and the Highway Establishment are very useful. One Appendix lists citizen action groups and government agencies involved in transportation and the environment. A profusion of valuable photographs makes the work unique.

McGraw Hill Book Company
1221 Avenue of the Americas
New York, New York 10020

** *Unsafe at Any Speed,* by Ralph Nader, revised edition, 1972. 367 pages. $1.95.

Paperback New edition of now classic study of car industry's alleged lack of attention to safety. Chapter 4, "The Power to Pollute," attributes the failure to control automobile pollution to industry delays, collusion, and miserliness. Book as a whole is indispensable for this view toward responsibility for pollution and efforts to control it, even though most of book is about automobile safety.

Bantam Books Inc.
666 5th Avenue
New York, New York 10022

* *Rethinking Your Automobile,* 1973. 6 pages. Free.

Flyer Brief discussion of consumer's role in reducing use of cars in view of the energy shortage.

Office of Public Affairs
U.S. Environmental Protection Agency
Waterside Mall
Washington, D.C. 20460

*** *Getting Around: People and the City,* 1974. 48 pages. $1.29.

Pamphlet Informative, thought-provoking case studies and discussions on urban transportation, including commuting, rapid transit, citizen action, dial-a-bus, mass transit, banning cars, and the Bay Area Rapid Transit (BART) in San Francisco. Discussion questions are provided. Well illustrated; photographs.

Scott, Foresman and Company
1900 Eastlake Street
Glenview, Illinois 60025

Superhighway--Superhoax, by Helen Leavitt, 1970. 95¢.

Paperback and operations; cites problems and issues in localities throughout the U.S.; special chapter on urban highway problems; information on alternative transit systems.

Ballantine Books, Inc.
201 E. 50th Street
New York, New York 10022

Governmental Approaches to Automobile Air Pollution Control, 1971. $3.00.

Pamphlet Discusses industry's control of auto emissions, consumer control, and advantages and disadvantages of standard-setting and traffic system designs.

National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22151
Publication No. PB203-952

Dead End: The Automobile in Mass Transportation, 1972. 231 pages. $1.45.

Paperback Comprehensive discussion of role of automobile in contemporary American life and detrimental effects it has had. Included are discussions of the energy problem, air pollution, freeways, and alternatives to the automobile.

Penguin Books Inc.
7110 Ambassador Road
Baltimore, Maryland 21207

* *A Citizen's Guide to Clean Air,* 1972. 95 pages. Free.

Pamphlet An extremely useful, detailed account of the clean air laws and how citizens can advocate and plan for the control of air pollution. One chapter deals with auto emission controls, another with the citizen's legal rights, and a third with the citizen's role in policy-making.

The Conservation Foundation
1717 Massachusetts Avenue, N.W.
Washington, D.C. 20036

** *The Campaign for Cleaner Air,* by Marvin Zeldin, 1973. 28 pages. 35¢.

Pamphlet Informative, factual account on clean air, including the Clean Air Act, implementing the law, controlling automobile pollution, and the citizen's role.

Public Affairs Pamphlets
381 Park Avenue, South
New York, New York 10016
Pamphlet No. 494

** *Don't Leave It All to the Experts: The Citizen's Role in Environmental Decision Making,* 1972. 19 pages. Free.

Pamphlet Identification of methods by which citizens can protect the environment, including becoming informed, knowing the law, lobbying, fighting for funds, and knowing your rights.

Office of Public Affairs
U.S. Environmental Protection Agency
Waterside Mall
Washington, D.C., 20460

*** *Rites of Way: The Politics of Transportation in Boston and the U.S. City,* by Alan Lupo, Frank Colcord, and Edmund P. Fowler, 1971. 294 pages. $3.95.

Paperback Detailed account of how community opposition in metropolitan Boston forced the state and local governments and quasi-independent commissions to abandon plans to construct freeways in and around the city. Book also discusses who makes transportation decisions in other major U.S. cities and the politics of such decisions. Excellent example of citizen action seeking to alter the environmental effects of transportation decisions on population displacement, traffic congestion, land use, and esthetics.

Little, Brown and Company
34 Beacon Street
Boston, Massachusetts

** *Ecotactics: A Sierra Club Handbook for Environment Activists,* 1970. 287 pages. 95¢.

Paper-back

Informative essays on the nature of several different aspects of the environmental crisis, including transportation's effects on the environment. Especially useful for descriptions of methods by which citizens can individually and collectively work to reduce pollution. Many readers, however, will find some of the tactics beyond their ability, energy, or interest, and inappropriate on ethical grounds. Many tactics described with reference to industrial pollution are equally applicable to pollution caused by transportation. Appendices list books, environmental groups and societies, and key federal agencies of relevance to activists.

Periodicals

Periodicals are a rich source of information on transportation and the environment and on the availability and location of additional relevant materials. Even general transportation or environmental periodicals contain in many issues articles of relevance. It was impossible, however, to provide here a list of useful articles that have appeared in the recent past in periodicals. Moreover, the subscriber or reader cannot know in advance when a periodical will print an article that will interest him. Despite these drawbacks, many teachers will find it useful to subscribe to or read library copies of periodicals in the expectation that they will discover articles or references to additional materials of immediate relevance to their teaching or research efforts. The more specifically a periodical is related to his or her particular interest, of course, the more likely is the reader to find relevant materials. Teachers and readers can also consult in libraries the *Readers' Guide to Periodical Literature* for past articles about transportation and the environment.

Bicycling!
119 Paul Drive, Box 3330
San Rafael, California 94903

Bike World
P.O. Box 336
2536 Middlefield Road
Mountain View, California 94040

Changing Times
The Kiplinger Magazine
Editors Park, Maryland 20782

Consumer News
Office of Consumer Affairs
Department of Health, Education and Welfare
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

Consumer Reports
Consumers' Union
256 Washington Street
Mt. Vernon, New York 10550

Environment Action Bulletin
33 East Minor Street
Emmaus, Pennsylvania

Newsletter of the American Council on Consumer Interests
238 Stanley Hall
University of Missouri
Columbia, Missouri 65201

Of Consuming Interest
Federal State Reports
P.O. Box 986
Arlington, Virginia 22216
(703) 527-4950

Transpo Topics for Consumers
Department of Transportation
Office of the Secretary
Washington, D.C. 20590

Government Information Agencies

For further information about transportation issues, contact the appropriate U.S. Department of Transportation or other government agencies listed below:

Agency Name and Address	*Telephone Number*
U.S. Department of Transportation 400 7th and D Streets, S.W. Washington, D.C. 20590	202-426-4321
Office of the Secretary of Transportation Office of Consumer Affairs (address above)	202-426-4520
National Highway Traffic Safety Administration Consumer and Public Affairs (address above)	202-426-0670
Federal Highway Administration Public Affairs (address above)	202-426-0648
United States Coast Guard Public Affairs (address above)	202-426-1587
Urban Mass Transportation Administration Public Affairs (address above)	202-426-4043
Federal Railroad Administration Public Affairs (address above)	202-426-0881
Federal Aviation Administration Public Affairs 800 Independence Avenue, S.W. Washington, D.C. 20591	202-426-3883
Interstate Commerce Commission Constitution Avenue and 12th Street, N.W. Washington, D.C. 20432	202-343-4761
Federal Trade Commission Bureau of Consumer Protection Pennsylvania Avenue and 6th Street, N.W. Washington, D.C. 20580	202-962-2358

Agency Name and Address	*Telephone Number*
Environmental Protection Agency 401 M Street, S.W. Washington, D.C. 20460	202-755-0890
Civil Aeronautics Board Office of the Consumer Advocate Washington, D.C. 20428	202-382-7735

Bibliography Evaluation Criteria

All teacher and student materials that were located were evaluated along two dimensions: quality and relevance. Quality was defined to include the following components:

- Provisions of creative and detailed classroom activities or learning experiences that go beyond the one- or two-sentence "have the students do x, y, z" suggestions
- Development of decision-making skills that may be transferable to other consumer issues
- Attention to affective educational approaches and objectives, not merely cognitive ones
- Emphasis on student initiative and involvement in classroom activities and in the planning of those activities
- Concentration on student concerns
- Clear presentation that allows teachers to develop additional activities and units of their own
- A modular, flexible approach that enables teachers to develop activities and units tailored to the needs of their particular students and community
- Provision of accurate factual information
- A non-moralistic, non-injunctive approach
- Stress on the needs and problems of minority groups
- An interdisciplinary approach to consumer education

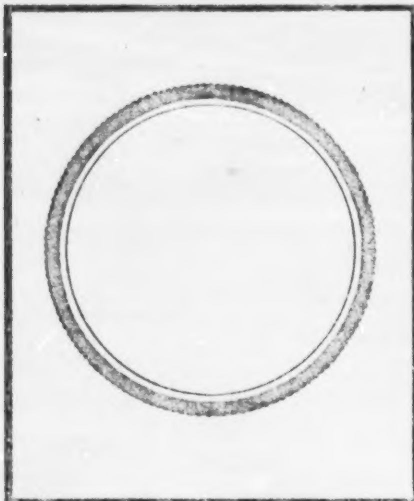
Few curriculum materials combined all these quality ingredients. Many include none or only a few. In some borderline cases where a teaching material contained some quality ingredients, the authors made a subjective evaluation on whether the material contained enough of these elements to warrant referencing in the Manual.

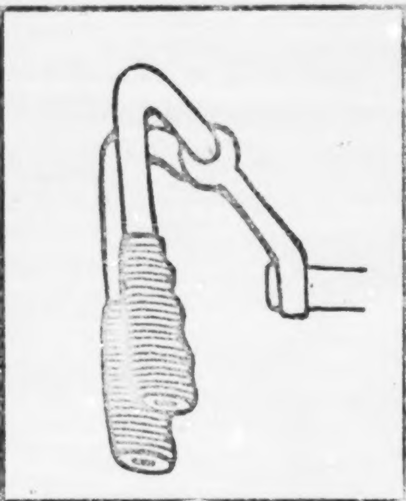
To be considered relevant a teaching material had to deal in a significant way with transportation from the point of view of or useful to a consumer. Teaching materials were excluded from the Manual when their relevance was extremely limited or nonexistent because

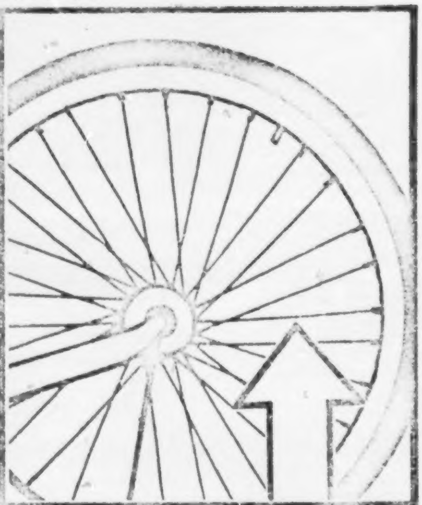
- Only a small section of the material dealt with transportation issues. However, such materials were included when a subsection was of high caliber. Dealt with an important aspect of transportation and the environment not covered elsewhere, or was part of an easily accessible and inexpensive unit.

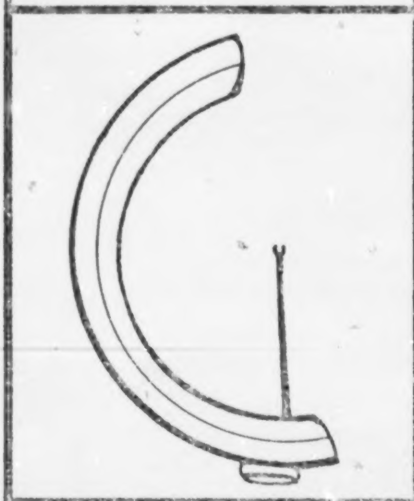
- The material was extremely specific--it dealt with too narrow an aspect of an issue to be useful to teachers or students except in highly specialized courses or units.
- The material was designed for a highly specialized audience.
- The material was oriented strictly toward career education.
- The material was outdated.
- The material contained information that applied primarily or significantly to a local situation.
- The material was not distributed out of state.

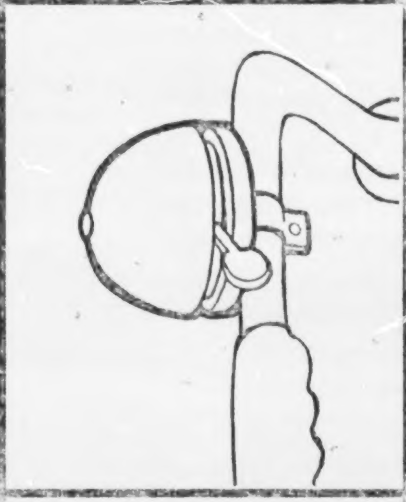
SPIRIT MASTER #1: FOR USE WITH ACTIVITY #1

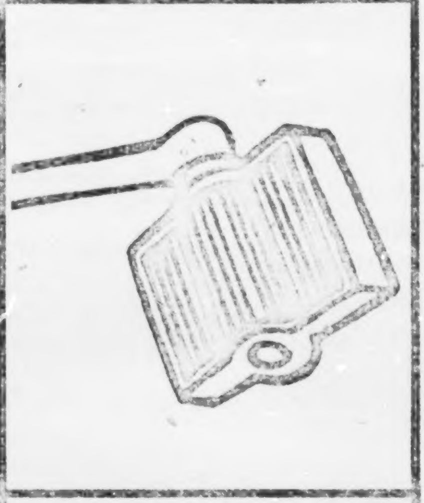






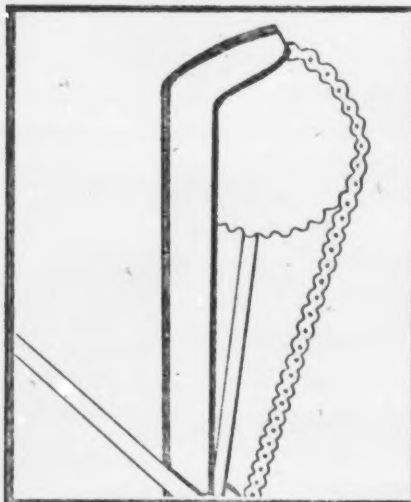


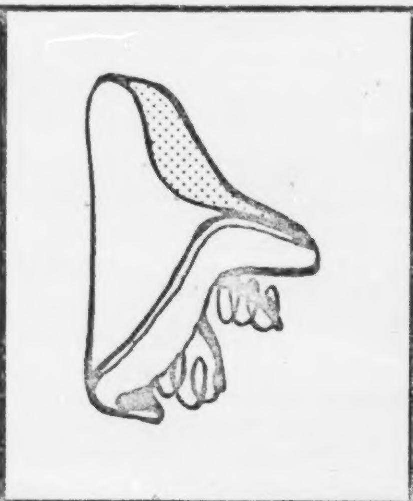


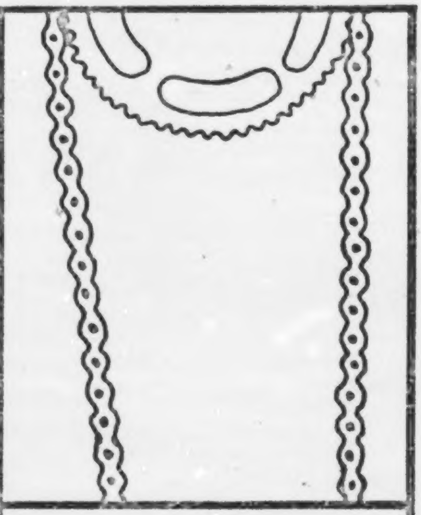


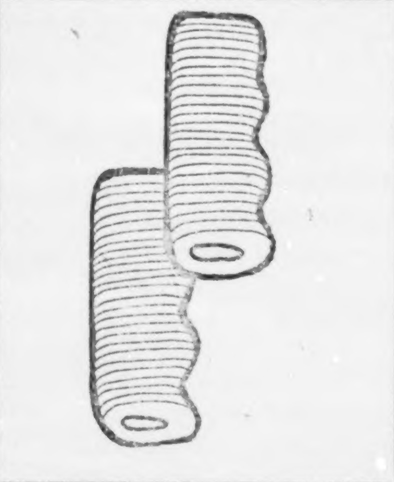
Seat	Tire	Handle Bar
Bell	Chain	Chain Guard
Fender	Kickstand	Pedal
Reflector	Spoke	Tire Valve

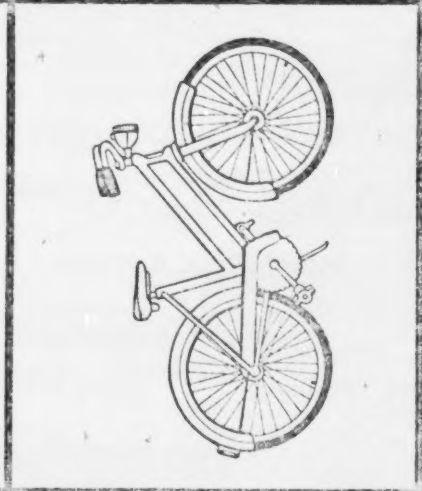
SPIRIT MASTER #2: FOR USE WITH ACTIVITY #1

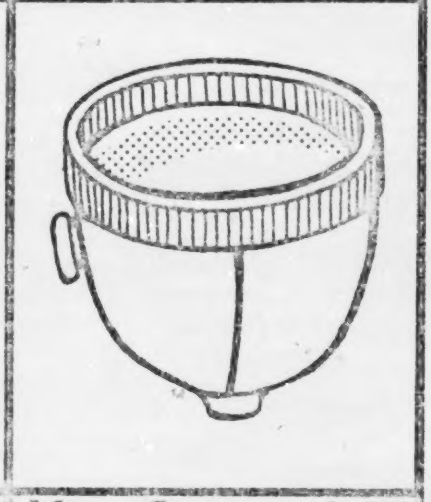


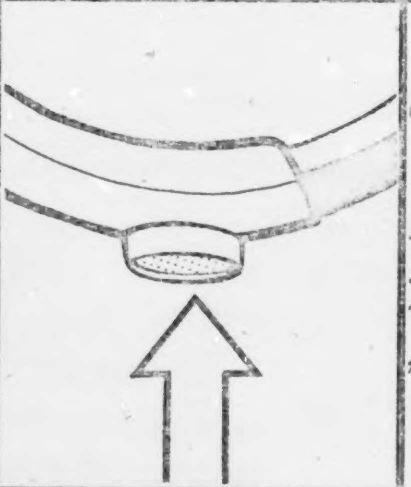


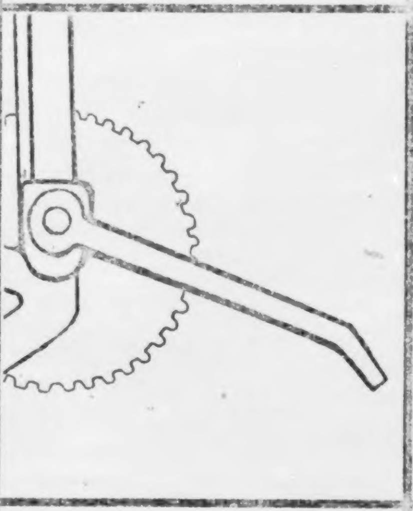


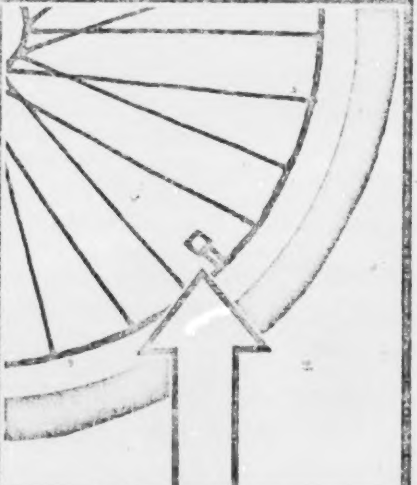






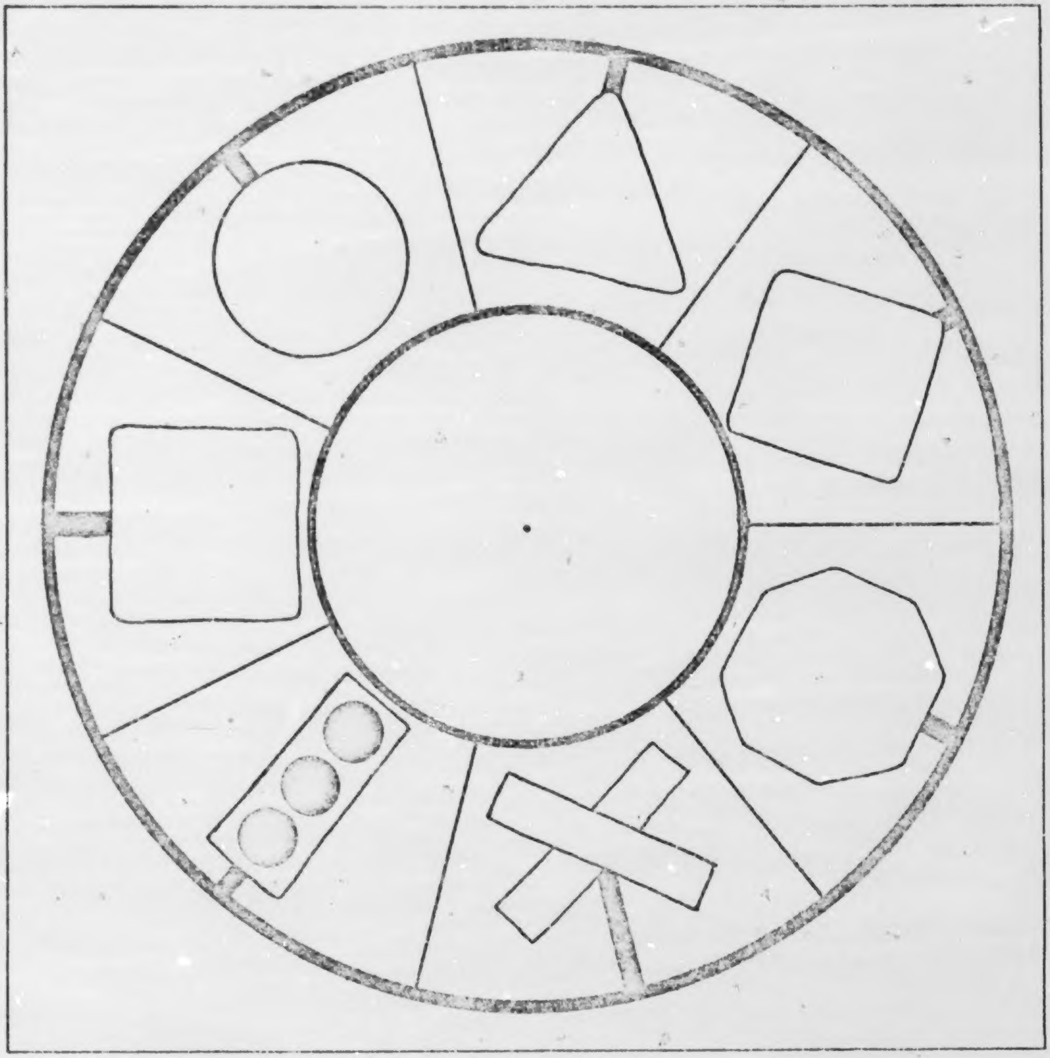






Bicycle	**Light**	**Grips**

SPIRIT MASTER #3: FOR USE WITH ACTICITY #5



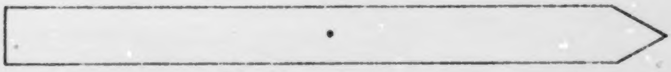
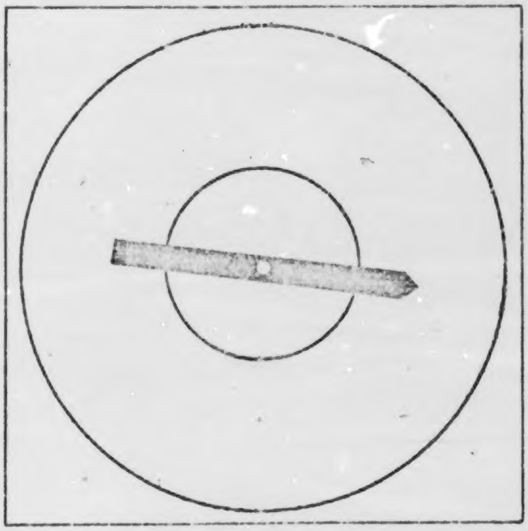


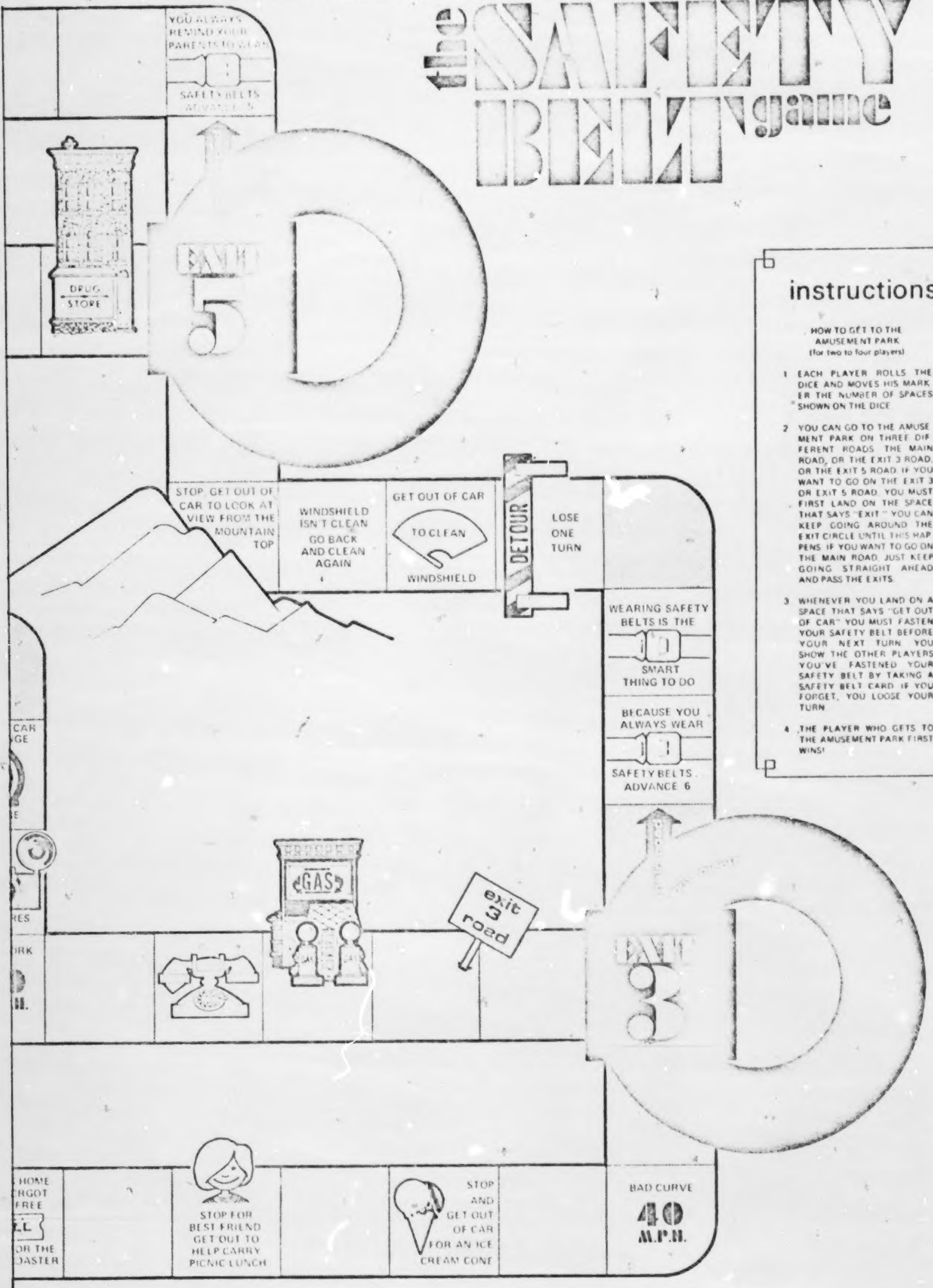
Illustration at right shows how arrow and circle should be assembled.



Directions
1. Cut out circle and arrow.
2. Paste circle and arrow on cardboard.
3. Cut out arrow.
4. Make small hole in center of circle and arrow where the dots show. Use protractor point.
5. Fasten arrow loosely onto circle using paper fastener.

SPIRIT MASTER #4: FOR USE WITH ACTIVITY #13

the SAFETY BELT game


YOU ALWAYS REMIND YOUR PARENTS TO WEAR SAFETY BELTS ADVANCE 5
DRUG STORE
EXIT 5
STOP. GET OUT OF CAR TO LOOK AT VIEW FROM THE MOUNTAIN TOP
WINDSHIELD ISN'T CLEAN GO BACK AND CLEAN AGAIN 4
GET OUT OF CAR TO CLEAN WINDSHIELD
DETOUR
LOSE ONE TURN
WEARING SAFETY BELTS IS THE SMART THING TO DO
BECAUSE YOU ALWAYS WEAR SAFETY BELTS. ADVANCE 6
CAR
GE
RES
ORK
GAS
exit 3 road
EXIT 3
HOME
RGOT
FREE
OR THE
OASTER
STOP FOR BEST FRIEND GET OUT TO HELP CARRY PICNIC LUNCH
STOP AND GET OUT OF CAR FOR AN ICE CREAM CONE
BAD CURVE 40 M.P.H.

instructions

HOW TO GET TO THE AMUSEMENT PARK
(for two to four players)

1 EACH PLAYER ROLLS THE DICE AND MOVES HIS MARKER THE NUMBER OF SPACES SHOWN ON THE DICE

2 YOU CAN GO TO THE AMUSEMENT PARK ON THREE DIFFERENT ROADS THE MAIN ROAD, OR THE EXIT 3 ROAD, OR THE EXIT 5 ROAD IF YOU WANT TO GO ON THE EXIT 3 OR EXIT 5 ROAD YOU MUST FIRST LAND ON THE SPACE THAT SAYS "EXIT" YOU CAN KEEP GOING AROUND THE EXIT CIRCLE UNTIL THIS HAPPENS IF YOU WANT TO GO ON THE MAIN ROAD JUST KEEP GOING STRAIGHT AHEAD AND PASS THE EXITS.

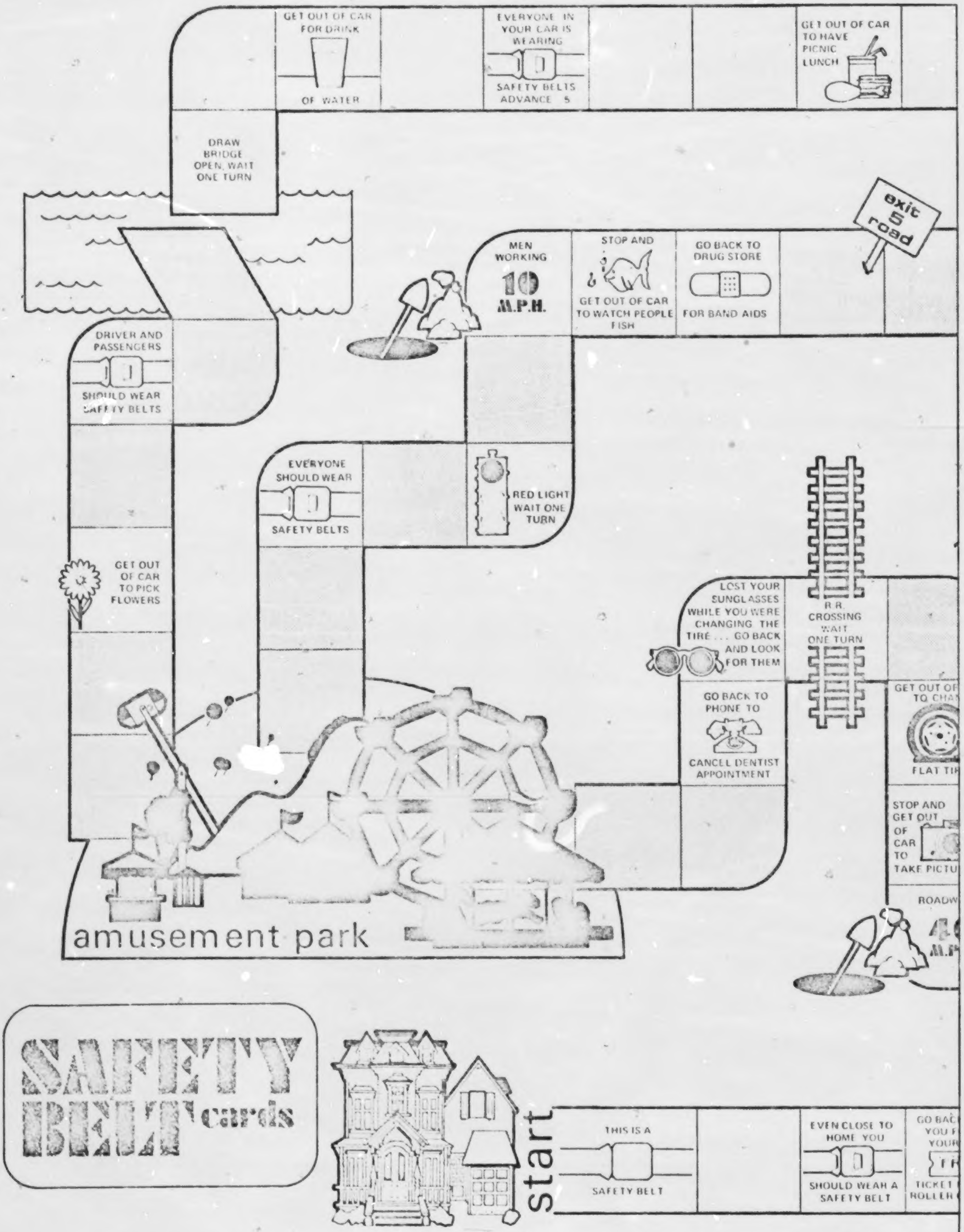
3 WHENEVER YOU LAND ON A SPACE THAT SAYS "GET OUT OF CAR" YOU MUST FASTEN YOUR SAFETY BELT BEFORE YOUR NEXT TURN YOU SHOW THE OTHER PLAYERS YOU'VE FASTENED YOUR SAFETY BELT BY TAKING A SAFETY BELT CARD IF YOU FORGET, YOU LOOSE YOUR TURN

4 THE PLAYER WHO GETS TO THE AMUSEMENT PARK FIRST WINS!

← *After trimming sheet A along the black line, line the cut edge up with this line and tape on the back.*

US Department of Transportation, National Highway Traffic Safety Administration

SPIRIT MASTER #5: FOR USE WITH ACTIVITY #13


GET OUT OF CAR FOR DRINK OF WATER
EVERYONE IN YOUR CAR IS WEARING SAFETY BELTS ADVANCE 5
GET OUT OF CAR TO HAVE PICNIC LUNCH
DRAW BRIDGE OPEN, WAIT ONE TURN
exit 5 road
MEN WORKING 10 M.P.H.
STOP AND GET OUT OF CAR TO WATCH PEOPLE FISH
GO BACK TO DRUG STORE FOR BAND AIDS
DRIVER AND PASSENGERS SHOULD WEAR SAFETY BELTS
EVERYONE SHOULD WEAR SAFETY BELTS
RED LIGHT WAIT ONE TURN
GET OUT OF CAR TO PICK FLOWERS
LOST YOUR SUNGLASSES WHILE YOU WERE CHANGING THE TIRE . . . GO BACK AND LOOK FOR THEM
R.R. CROSSING WAIT ONE TURN
GO BACK TO PHONE TO CANCEL DENTIST APPOINTMENT
GET OUT OF
TO CHA
FLAT TI
STOP AND GET OUT OF CAR TO TAKE PICTU
ROADW
4
M.P
amusement park
SAFETY BELT cards
start
THIS IS A SAFETY BELT
EVEN CLOSE TO HOME YOU SHOULD WEAR A SAFETY BELT
GO BAC
YOU F
YOUR
TR
TICKET
ROLLER

Sheet A Trim along black line. →

SPIRIT MASTER #6: FOR USE WITH ACTIVITY #13

cut on black lines on the other side

SAFETY
BELTcards

SAFETY
BELTcards

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BELTcards

SAFETY
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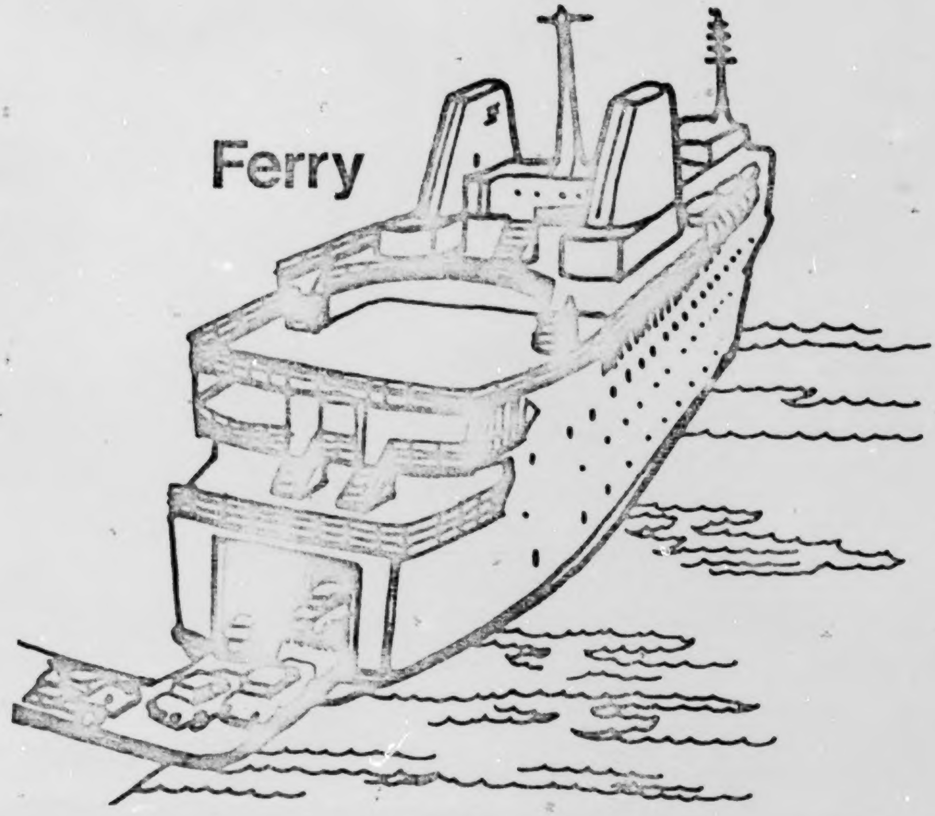
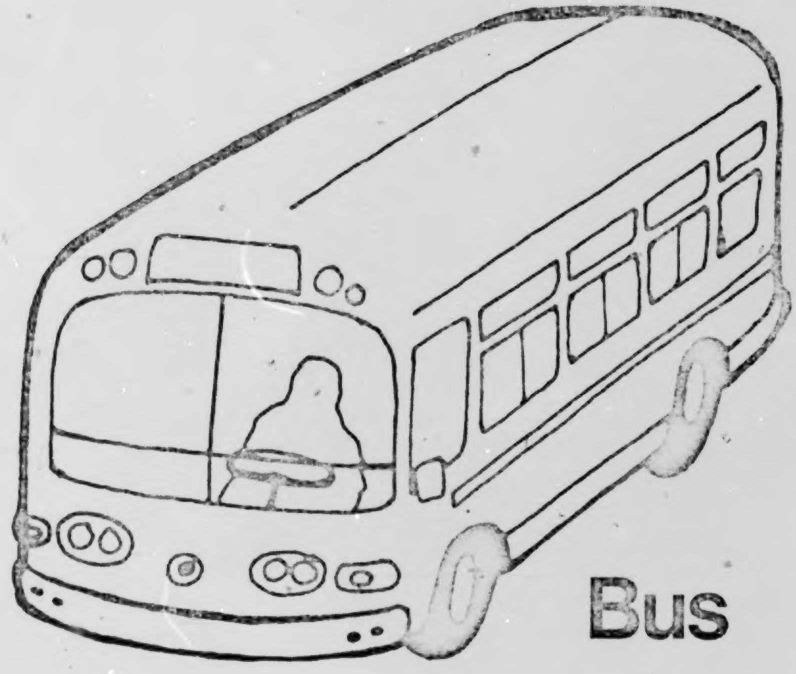
Belts are worn just everywhere Even in planes that fly in the air.		
Here's a belt for you and me Now, how safe you'll be.	Accidents happen near and far So buckle the belts in your car.	If safety belts are always on You'll be safe as long as you're gone.
No matter where you are buckle-up in the car.	Safety belts should be worn by others, your mothers and father, your sisters and brothers.	Astronauts wear safety belts traveling very far Also, when they're in a car.
Whenever you go fast or slow Buckle-Up!	Safety belts are for kids like you And for Mommy and Daddy, too.	Men wear safety belts in a fast car race You should wear yours when you sit in your place.
Buckle safety belts on a trip – that's a very good tip.	When you leave the car just for a minute Buckle the belt when you're back in it.	To ride safe and sound wherever you go Fasten the belts on the way to and fro!

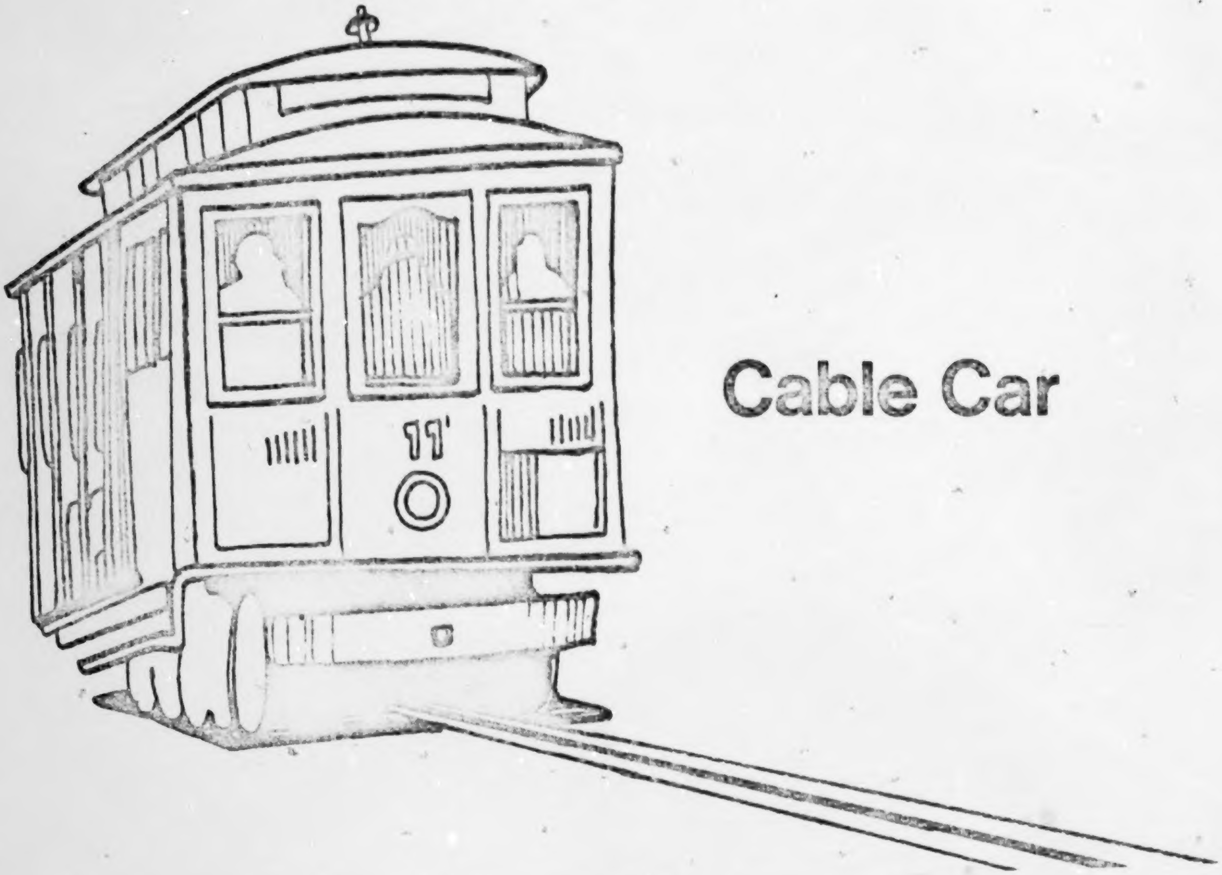
SPIRIT MASTER #7: FOR USE WITH ACTIVITY #13

SPIRIT MASTER #8: FOR USE WITH ACTIVITIES #27 AND #31

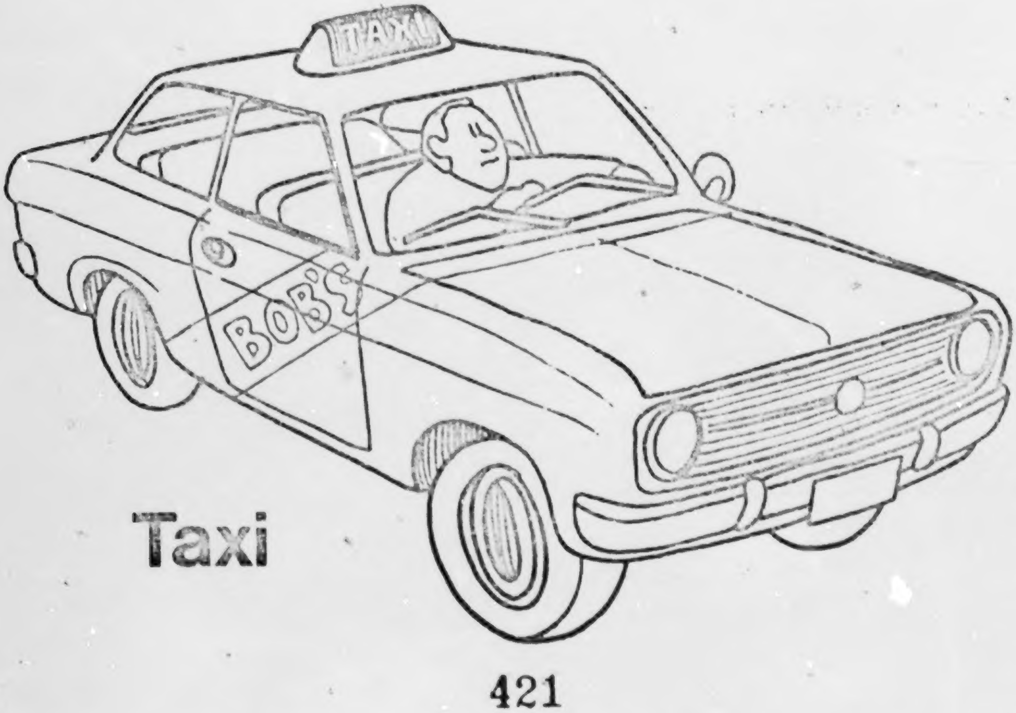




SPIRIT MASTER #9: FOR USE WITH ACTIVITIES #27 AND #31



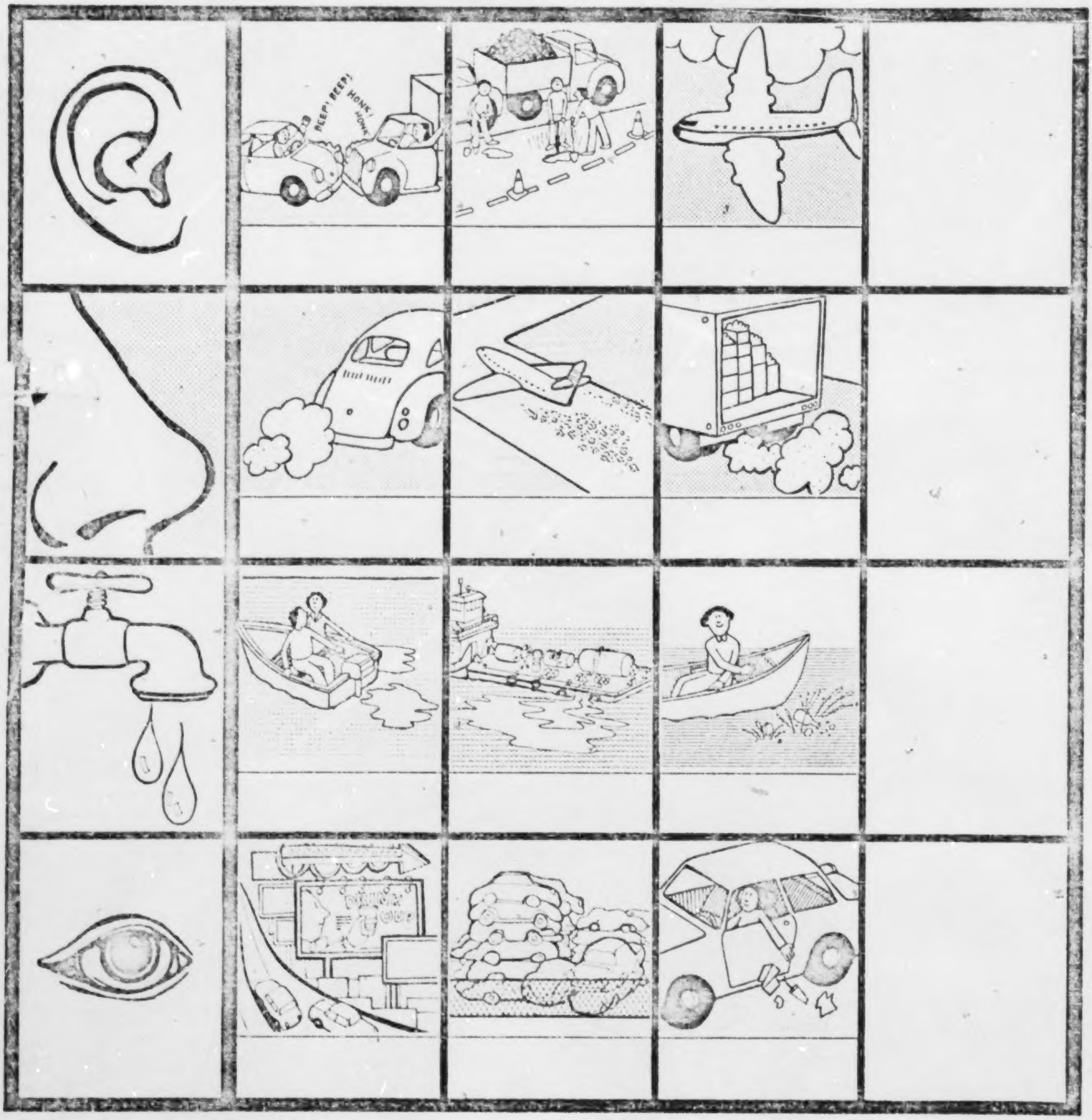
Cable Car



Taxi

SPIRIT MASTER #10: FOR USE WITH ACTIVITY #43

Pollution Chart


BEEP! BEEP!
HONK! HONK!